CERCLA PRELIMINARY ASSESSMENT

REPORT

for

WOLVERINE WORLD WIDE FORMER TANNERY

123 NORTH MAIN STREET
ROCKFORD, MICHIGAN 49341

U.S. EPA ID NO.: MIN000510613

Assistance #: V-00E00778-3

June 14, 2012

Completed By: _____ Date: 6/14/12

Joseph Walczak, Pre-Remedial Program Manager

Reviewed And Approved By: _____ For Date: 6/15/12

Daria W. Devantier, Chief

Site Assessment and Site Management Unit
Superfund Section
Remediation Division
Michigan Department of Environmental Quality

Reviewed And Approved By: _____ Date: 6/15/12

Site Assessment Manager
Region 5
United States Environmental Protection Agency

PRELIMINARY ASSESSMENT
Wolverine World Wide Former Tannery

TABLE OF CONTENTS

Section 1.0 Introduction

On August 3, 2011, the United States Environmental Protection Agency (U.S. EPA) tasked the Michigan Department of Environmental Quality (MDEQ) to conduct a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Preliminary Assessment (PA) of the Wolverine World Wide Former Tannery site (Site) (U.S. EPA ID No.: MIN000510613). The need for conducting this PA was as a result of a petition from a local citizens group to the U.S. EPA to conduct this assessment. The petition was dated June 21, 2011 and was sent to Mr. Rick Karl, Director, Superfund Division – Region 5, U.S. EPA. Upon assessment of the petition, the U.S. EPA discovered the Site into the CERCLA Site Assessment process on July 20, 2011.

The authority for this PA work was granted to the MDEQ through a cooperative agreement (CA) with the U.S. EPA (Assistance ID No.: V-00E00778-3). The Site consists of an area where the Wolverine World Wide (WWW) company historically operated a chromium leather tannery plant. The site is located in the city of Rockford, Kent County, Michigan on the east bank of the Rogue River.

The PA is performed under the authority of CERCLA and is the initial investigatory step in the CERCLA Superfund process. The PA involves a limited scope investigation that collects readily available information. The PA is designed to distinguish between sites that pose little or no threat to human health and the environment and those that require further investigation. The PA may also support emergency response activities and public information needs.

If the findings of the PA determine that further investigation is warranted, the Site will continue to progress through the Superfund investigative process and undergo a CERCLA Site Inspection (SI). The SI will further evaluate threats to human health and the environment and collect additional data for further evaluation in the Superfund process. This evaluation may be accomplished through the collection and analysis of additional waste and environmental media samples to determine whether hazardous substances are present at the Site and are migrating to the surrounding environment and potential human and environmental targets. The SI provides the necessary information required to determine if the Site qualifies for possible inclusion on the National Priorities List (NPL) or if the Site should be designated as No Further Remedial Action Planned (NFRAP) in the Superfund process. At any time throughout the Superfund evaluation process, the Site may be designated as NFRAP, be referred to another state or federal cleanup program (Other Cleanup Authority [OCA]), or be recommended for further Superfund action.

In conjunction with this PA work, the MDEQ also assisted the U.S. EPA Emergency Removal Branch (ERB) in their removal assessment of the Site. This work was conducted as part of the Removal Program Support Activities task in the U.S. EPA approved CA. The MDEQ assistance included conducting in-situ X-ray fluorescence (XRF) screening of soils, oversight of soil, groundwater, and sediment sample collection by the site owner's consultant, sediment sample collection and analysis of sediments

from specific areas in the Rogue River, and general Site investigation assistance. The MDEQ also participated in a public meeting held on April 24, 2012 to present information regarding the Superfund process and current Site information to the general public.

Section 2.0 Site Background

Section 2.1 Site Description

The Site is located at 123 North Main Street on the north end of the downtown district of the city of Rockford, Kent County, Michigan (T.9N., R.11W., section 36) (see Figure 1). The site is currently owned by WWW. The main plant site historically encompassed an area of approximately 15 acres. The location coordinates for the Site at the former main tannery building are latitude 43.123056° and longitude -085.560278°.

The Site historically consisted of the former tannery operations including: tannery buildings, an on-site wastewater treatment plant, warehouse and storage buildings, and an office building. See Figure 2 for a map of the historical features of the site. All but one of the tannery structures have been demolished. The structure that remains was one of the tannery operations buildings on the north end of the Site. This building is currently being used for the commercial retail operations for WWW. The Site is situated on the north end of the commercial downtown area of the city of Rockford. Commercial businesses are located to the south of the site, residences are located to the east and north, and the Rogue River and residences are located to the west. A recreational trail, the White Pine Trail, runs through the western portion of the Site along the bank of the Rogue River.

Section 2.2 Site History

Operations on the Site began in approximately 1903 when G.A. Krause and his sons built a shoe factory on the northern portion of the Site. The tannery operations began on the southern portion of the Site in approximately 1908 when Mr. Krause and his sons built the tannery to supply their shoe factory with leather. The tannery used chromium as a means to tan its hides. Operations at the site included the tanning and coloring of hides for use mainly in shoes.

Waste disposal practices in the early years of operation are not known. The company did construct a wastewater treatment plant (WWTP) sometime between 1950 and 1960. Some sludge from plant operations is known to have been disposed of in a gravel pit located several miles south of the Site. Anecdotal reports from former company workers indicate that some sludge may have been spread on at least two separate farms in the area as fertilizer.

During construction of the White Pine Trail, the company exchanged easements with the Michigan Department of Transportation (MDOT) to give access to the western portion of the site for the trail along the Rogue River. MDOT had control of the old rail line that traversed a portion of the site from south to north.

Tannery operations ceased in 2010 and the buildings on the Site were demolished in 2010 and 2011. Due to concerns at the Site noted during the demolition and general

concerns about potential contamination at the Site, a citizens group petitioned the U.S. EPA on June 21, 2011 to assess the Site in the CERCLA program.

Section 2.3 Regulatory Status

With the exception of local permits for wastewater discharge to the municipal sewer system and a state storm water discharge permit, there was minimal environmental regulatory actions at the Site until after the demolition at the Site was complete. As a result of the concerns noted during the demolition, the company initiated environmental investigation work to assess the concerns with regard to the voluntary portion of the state's Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Part 201). The company installed and sampled three wells and installed another five piezometers as part of this work. As a result of the PA petition, the Site is now discovered to the CERCLIS database and has been entered into the state's cleanup program as a facility needing assessment. In conjunction with the PA, the U.S. EPA ERB is also conducting a removal assessment to determine whether any time critical or non-time critical emergency removal actions are warranted at the Site.

Section 3.0 Environmental Investigations

Prior to the work being conducted as a result of this CERCLA activity, there had been only minimal environmental investigation work conducted on the Site. This work was conducted by the company in conjunction with geotechnical investigations at the Site for plant expansions.

As noted in the previous section, the company initiated a limited environmental investigation to assess three areas of concern noted during the demolition. This work was started in May of 2011 and completed in September of 2011. The company had three wells and five piezometers installed. Samples collected from the three wells showed arsenic (37 micrograms per liter [ug/l]) and ammonia (20,000 ug/l) at levels elevated above Part 201 drinking water and groundwater surface water interface criteria.

As a result of the findings of the initial investigation and the CERCLA PA that was initiated in August of 2011, the company proposed additional investigation work which they designated as Round 2 Environmental Investigation. This work included the installation of additional monitoring wells and the collection of deep and surficial soil and groundwater samples from the Site and sediment and pore water samples from the Rogue River. Figures 3 through 5 show the locations of these samples. This work was done in consultation with the U.S. EPA and the MDEQ and the sampling activities were overseen by a U.S. EPA contractor and MDEQ staff. At the request of the U.S. EPA, the company split the soil and sediment samples with the U.S. EPA contractor for separate analysis.

The analytical results of the deep and surficial soil samples collected during this investigation are summarized in Tables 1 and 2, respectively. The data generated by the soil sampling indicates that there has been observed releases of contaminants to the soils on the Site. This is evidenced by contaminant concentrations above sample quantitation limits being more than three times background concentrations. Soil sample concentrations in the tables are also compared to Part 201 Non-residential Direct Contact Criteria (NRDCC) and Groundwater Surface Water Interface Protection Criteria (GSIPC) as a potential risk screening scenario. The complete list of the Part 201 Generic Cleanup Criteria and Screening Levels can be found in Appendix A. Contaminants with their maximum concentrations are noted in the following paragraph.

Arsenic (360,000 micrograms per kilogram [ug/kg]), chromium (total) (49,000,000 ug/kg), and lead (930,000 ug/kg) were detected in deep soils at concentrations exceeding NRDCC. No surficial soil samples showed any NRDCC exceedances. Several contaminants were detected in both the deep and surficial soil samples at concentrations exceeding the GSIPC. These include: 1,2-dichlorobenzene (2,300 ug/kg); 1,4-dichlorobenzene (390 ug/kg); fluoranthene (13,000 ug/kg); phenanthrene (11,000 ug/kg); arsenic (360,000 ug/kg); barium (650,000 ug/kg); cadmium (17,000 ug/kg); chromium (total) (49,000,000 ug/kg); hexavalent chromium (17,000 ug/kg); lead (930,000 ug/kg); mercury (total) (640 ug/kg); selenium

(2,200 ug/kg); silver (450 ug/kg); zinc (1,000,000 ug/kg); ammonia (556,000 ug/kg); and cyanide (550 ug/kg) in the deep soils. GSIPC exceedances in the surficial soil samples include: fluoranthene (5,800 ug/kg); phenanthrene (3,600 ug/kg); arsenic (11,000 ug/kg); chromium (total) (180,000 ug/kg); mercury (total) (340 ug/kg); selenium (1,200 ug/kg); silver (150 ug/kg); zinc (210,000 ug/kg); ammonia (316,000 ug/kg); and cyanide (410 ug/kg)

Table 3 provides a summary of the groundwater data that was collected during the Round 2 investigation. While there were no background groundwater samples collected during this investigation, the data indicates that there has most likely been an observed release of contaminants to the groundwater on the Site based on the fact that tannery waste contaminants are present in the groundwater samples. Contaminant concentrations in the table are also compared to Part 201 Residential Drinking Water Criteria (RDWC) and Groundwater Surface Water Interface Criteria (GSIC). Groundwater contaminants that exceed one or both of these criterion, along with their maximum concentrations, are noted in the following paragraph.

Arsenic (30 micrograms per liter [ug/l]), boron (770 ug/l), iron (9,800 ug/l), vanadium (10 ug/l), ammonia (46,000 ug/l), chloride (480,000 ug/l), and sulfates (500,000 ug/l) were detected at concentrations that exceeded the RDWC. In addition, 4-chloro-3-methylphenol (3 ug/l), arsenic (30 ug/l), chromium (total) (54 ug/l), hexavalent chromium (85 ug/l), ammonia (46,000 ug/l), and cyanide (16 ug/l) were detected at concentrations exceeding GSIC.

A summary of the data from the sediment samples collected during Round 2 can be found in Table 4. Due to concerns from the local citizens group regarding potential impacts to the Rogue River, the U.S. EPA and MDEQ determined that it would be beneficial to collect additional sediment samples from specific areas of the river. These data are also summarized in Table 4. The sediment data indicate an observed release of contaminants above background levels to the surface water pathway. Sediment contaminant concentrations are also compared to the range of Part 201 Sediment Screening Levels in the table. Sediment contaminants that exceeded at least one of these screening levels are noted in the following paragraph along with their maximum concentration.

Contaminants that had a maximum concentration that exceeded all screening levels include: chromium (total) (520,000 ug/kg) and mercury (total) (5,100 ug/kg). Contaminants that had concentrations that exceeded at least one screening level include: fluoranthene (620 ug/kg); pyrene (550 ug/kg); arsenic (16,000 ug/kg); cadmium (1,300 ug/kg); copper (66,000 ug/kg); lead (130,000 ug/kg); and zinc (290,000 ug/kg).

Section 4.0 Potential Sources

There are four known source areas on the Site. These include a former abandoned underground storage tank (UST), the "pit" area, soils in the former wastewater treatment area, and soils on the western portion of the Site along the river. Soil samples collected from these areas have shown some elevated levels of contaminants. The UST source area consists of soils around the abandoned UST that have shown elevated levels of both organic and inorganic contaminants, including 1,2-dichlorobenzene; 1,4-dichlorobenzene; xylenes; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; fluoranthene; indeno(1,2,3-cd)pyrene; phenanthrene; pyrene; arsenic; barium; chromium (total); hexavalent chromium; copper; lead; mercury; and zinc. This area has not been fully delineated.

The "pit" area consists of an approximately 50 by 50 feet area under the former maintenance building and the soils around this area where wastes from the plant operations are reported by former workers to have pooled prior to discharge to the WWTP. Historical anecdotal accounts report that this area could potentially be larger and that it would sometimes backup and the wastes would overflow out of the "pit." The company contends that this area was a spot where cracks in waste piping caused a void to be created under the maintenance building floor. By either account, wastes were released in this area. During demolition, the company reported that they removed approximately 252 cubic yards of contaminated soils and sludges from this area but no testing was done to confirm the waste concentrations in the removed material or whether a clean closure was attained. Soil samples from the area contained elevated levels of the following contaminants: ethylbenzene; n-propylbenzene; toluene; 1,2,3-trimethylbenzene; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; xylenes; acenaphthene; acenaphthylene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; dibenzofuran; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; arsenic; barium; chromium (total); hexavalent chromium; copper; lead; mercury; zinc; ammonia; cyanide; and sulfide.

Soils in one area of the former WWTP were also noted by the company to be visually contaminated during the demolition. Soil sampling documented some inorganic contamination in this area. Contaminants in this area include: chromium (total); hexavalent chromium; mercury; ammonia; and sulfide. This contamination was also not fully delineated.

Soil sampling was also conducted along the banks of the Rogue River on the west side of the site. These samples documented some elevated levels of inorganic contaminants in the surficial soils. Screening of these soils with an XRF unit also detected inorganic contaminants. Contaminants in this area include: anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene;

phenanthrene; pyrene; arsenic; chromium (total); hexavalent chromium; mercury; zinc; ammonia; and cyanide. The extent of this contamination has not been fully delineated.

Section 5.0 Pathway Discussions

Section 5.1 Groundwater

Given the data available to date, it is very likely that there has been a documented release of contaminants into the groundwater pathway at the Site. Groundwater samples collected from monitoring wells on the Site have shown detectable levels of ammonia, arsenic, cyanide, hexavalent chromium, and sulphates. No background samples have been collected to date since no background monitoring wells have been installed but given that these contaminants can be associated with tannery wastes, and the fact that the samples were collected from wells just downgradient of source areas, there is a high likelihood that these contaminants in the groundwater are the result of releases from source areas on the Site. There is also a likelihood that contaminants in the groundwater pathway may be located in other areas of the Site that have not been investigated due to historic operations on the Site.

The near surface geology in the area of the Site consists of glacial outwash sand and gravel deposits and end moraine complexes. These deposits occur as fluvial terraces along the Rogue River with the end moraine complexes flanking the river and underlying the terrace deposits. The terrace deposits range in thickness from approximately 10 to 60 feet while the morainal deposits can exceed 300 feet in thickness. The bedrock geology of the area consists of the Red Beds and Grand River Formation. The depth to bedrock in the Site area ranges from approximately 215 to over 320 feet.

The groundwater migration pathway is considered a pathway for contaminant migration in this area due to the highly permeable sand and gravel soils that are present, the fact that groundwater is used for drinking water within the 4-Mile Target Distance Limit (TDL), and the fact that groundwater flows toward and discharges into Rum Creek and the Rogue River. Analysis of groundwater samples collected from the Site monitoring wells has shown elevated levels of contaminants associated with tannery wastes.

All area residents within the 4-Mile TDL utilize groundwater wells for obtaining their drinking water. See Figure 6 for the 4-Mile Site Radius Map. Residents of the city of Rockford are served by a municipal system that utilizes wells located approximately one mile southeast of the Site. Approximately 5,484 residents are served by this system. The remainder of the residents located within the 4-Mile TDL utilize private drinking water wells. The approximate residential population served by private wells by radius ring is listed in the table below:

Distance from Site	Estimated population served by residential wells
0 – ¼ Mile	0
¼ - ½ Mile	0
½ - 1 Mile	269
1 – 2 Mile	3,079
2 – 3 Mile	7,591
3 – 4 Mile	8,433
Total	19,372

Section 5.2 Surface Water

The surface water pathway is a major exposure pathway of concern for this Site. Surface drainage in the area of the Site flows either directly into Rum Creek or the Rogue River. The Rogue River eventually discharges into the Grand River approximately seven miles downstream of the Site. See Figure 7 for the 15-Mile Target Distance Limit Map. Analysis sediment samples collected from the Rogue River adjacent to the Site showed some elevated levels of inorganic analytes including: arsenic; total chromium; hexavalent chromium; copper; lead; mercury; and zinc.

The Probable Point of Entry (PPE) of contaminants into the surface water pathway is all along Rum Creek as it passes through the Site and all along the eastern bank of the Rogue River on the west side of the Site. The furthest downstream PPE is at the southwest corner of the Site on the bank of the Rogue River. The 15-Mile TDL for the surface water pathway includes Rum Creek through the Site, the Rogue River at and downstream of the Site, a portion of the Grand River downstream of the confluence with the Rogue River, and the associated wetlands along the 15-Mile TDL. The Grand River eventually discharges into Lake Michigan outside of the 15-mile TDL.

There are no known surface water intakes along the 15-Mile TDL but the city of Rockford historically operated an intake on the Rogue River downstream of the Site. The Rogue and Grand Rivers are used quite extensively for recreation and fishing. The city has a canoe/kayak launch on the east bank of the river just downstream of the Site. The city also just completed construction of a boardwalk with fishing platforms on the western bank of the river opposite the Site. Approximately 14.45 miles of wetland frontage have been documented along the 15-Mile TDL. Sensitive environmental resources along the 15-mile TDL include: six state threatened species, seven state endangered species, and two federal threatened species. These are all located downstream of the PPE and downstream of where sediment samples were collected.

Section 5.3 Soil Exposure

Soil samples collected from the Site in three known source areas have been shown to be contaminated with elevated levels of several organic and inorganic contaminants. These soils are located at relatively shallow depths but are all in the main plant area that has been demolished, covered with topsoil, and is fenced. There are, however, some soils located along the recreational trail that were once part of the Site operational area that do have some slightly elevated levels of organic and inorganic contaminants at or near the surface. This area is not fenced and is accessible to the general public.

The potential exists for soil contamination in other areas of the main plant area of the Site based on the former tannery processes at the Site. There are no schools located within 200 feet of the Site but some residences are located with 200 feet of the Site boundary. The recreational trail located on the west side of the Site is regularly used by bikers and walkers. The approximate population affected by soil exposure within a 1-mile radius of the Site is detailed in the table below:

Distance from Site	Estimated population
0 – ¼ Mile	513
¼ - ½ Mile	1,249
½ - 1 Mile	2,693
Total	4,455

Section 5.4 Air

Migration of contaminants via the air pathway is possible, though not very likely. The majority of the known contamination is either in areas that are well vegetated or are subsurface. Some surficial soil contamination is present along the recreational trail on the west side of the Site but this area is fairly well vegetated to prevent possible windblown particulate migration. There is a minimal potential for migration of Site contaminants through the air pathway. Some of the potential contaminants associated with the tannery operations are volatile and have a potential for gas migration.

The approximate population affected by the air exposure pathway within a 4-mile radius of the Site is detailed in the table below:

Distance from Site	Estimated population
0 – ¼ Mile	513
¼ - ½ Mile	1,249
½ - 1 Mile	2,693
1 – 2 Mile	4,377
2 – 3 Mile	7,591
3 – 4 Mile	8,433
Total	24,856

Section 6.0 Summary

The MDEQ was tasked by the U.S. EPA to conduct a PA of the Site to evaluate the current and potential impacts to surrounding human populations and environmental resources through the groundwater, surface water, soil exposure, and air pathways and to use this evaluation to determine the status of the Site in the Superfund process. The U.S. EPA initiated the PA as a result of a petition which they received from a local citizens group. This evaluation is based on existing data and information for the Site and research of available information for the Site area and the Site's potential contaminant sources.

The Site consists of a parcel totaling approximately 15 acres located on the north end of the downtown area of the city of Rockford. The site is located in a residential/commercial area of the city along the eastern bank of the Rogue River.

The tannery began operations at the Site in 1908. The plant operated until 2010 when demolition of the plant building began. Due to concerns during the demolition, a local citizens group petitioned the U.S. EPA to assess the Site through the CERCLA Site Assessment process.

The Site was discovered into CERCLIS on July 20, 2011. As a result of environmental concerns documented during the demolition and the initiation of the CERCLA process, WWW initiated some environmental investigation work on areas of the Site where wastes and a UST were discovered during demolition and where some concerns were reported due to storm water runoff during demolition operations. Analysis of samples collected during this investigation work found some releases of contaminants into the environment

Groundwater on the Site has likely been impacted by tannery contaminants. Samples from monitoring wells located at and downgradient of source areas have shown elevated levels of ammonia, arsenic, cyanide, hexavalent chromium, and sulphates. All residents within a 4-mile radius of the Site use groundwater for drinking water. These include the residents of the city of Rockford that are serviced by wells operated by the city as well as those residents outside the city limits who utilize residential wells. Given the proximity to the river and the groundwater flow direction toward the river, it is also likely that contaminated groundwater discharges to the river.

Sediments in the Rogue River have been shown to be impacted from contaminants associated with the Site. Total chromium, hexavalent chromium, and mercury have been detected in sediment samples at levels elevated above background concentrations.. The PPE of contaminants to the river is along Rum Creek as it passes through the Site, along the western Site boundary and potentially where groundwater from the Site discharges to the river. The 15-mile TDL includes Rum Creek through the Site, approximately seven miles of the Rogue River downstream of the Site, and eight miles of the Grand River downstream of its confluence with the Rogue River. These rivers are used for recreation and fishing. Approximately 14.45 miles of wetlands

frontage are also present along the 15-mile TDL along with several documented occurrences of state and federal threatened and endangered species.

Area residents are potentially at risk of direct contact to contaminated soils at the Site. Slightly elevated levels of organic and inorganic contaminants have been detected in the surficial soils along the western side of the Site along the recreational trail and the bank of the Rogue River. The majority of the Site where the main plant buildings were located is fenced and has been covered with topsoil. The area along the trail on the western side of the Site is accessible. The trail is used regularly by walkers and bikers.

The potential for air migration of contaminants is minimal given the fact that the Site is relatively well vegetated. The potential for gas migration of contaminants is also minimal due to the low levels of volatile contaminant found to date.

Section 7.0 References

Concerned Citizens for Responsible Redevelopment (CCRR) , Preliminary Assessment Petition and Summary of Concerns, Related to the Recent Demolition of the 15-acre Wolverine World Wide Inc. Tannery site in Rockford, MI and its Long-term Environmental Impact on the Rogue River Watershed, June, 2011.

Environmental Data Resources, Inc. (EDR), Certified Sanborn® Map Report: Wolverine World Wide Former Tannery, 123 North Main Street, Rockford, MI 49341 (Inquiry Number: 3331727.3), May 29, 2012.

EDR, The EDR Aerial Photo Decade Package: Wolverine World Wide Former Tannery, 123 North Main Street, Rockford, MI 49341 (Inquiry Number: 3331727.5), May 31, 2012.

Fishbeck, Thompson, Carr & Huber, Phase I Environmental Site Assessment, Michigan Northern Railroad Between Courtland and Main Streets, Rockford, Michigan, January 1994.

Michigan Department of Environmental Quality (MDEQ), Public water supply intakes in Michigan: Great Lakes and connecting waters. Appendix N - public water supply intake map, 1999.

MDEQ, Quality Assurance Project Plan for Region 5 Superfund Site Assessment and Brownfield Activities in Michigan, January 16, 2003.

MDEQ, Community Water Supply Inventory. A Microsoft Excel workbook containing community water supply information, courtesy of Ms. Kristen S. Philip, Resource Specialist, MDEQ Water Bureau Field Operations Section, Lansing, Michigan, January 16, 2004.

MDEQ, Remediation Division (RD) Operational Memorandum No. 1, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels, March 25, 2011.

MDEQ, RRD Operational Memorandum No. 4 (Site Characterization and Remediation Verification), Attachment 3 (Sediments), Interim Final, August 2, 2006.

Michigan Department of Information Technology (MDIT), Aerial photographs that include the Wolverine World Wide Former Tannery site: 1992, 1998.

Michigan Department of Environmental Quality, (MDEQ), Remediation Division, Superfund Section, Wolverine World Wide Former Tannery site file, June 2012.

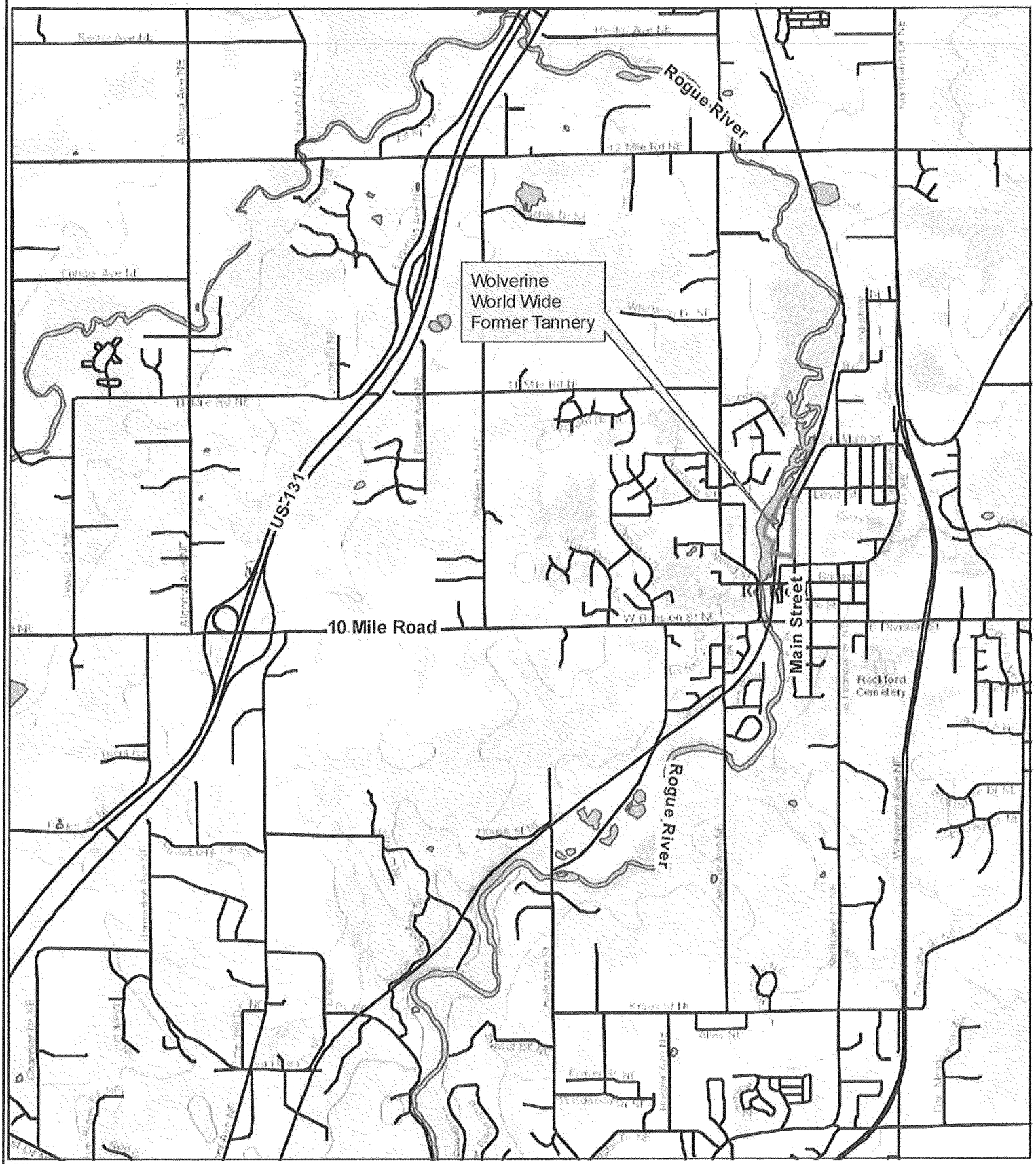
Rose & Westra, Inc., Wolverine World Wide – Former Rockford, Michigan Tannery – Post Demolition Environmental Investigation, September 19, 2011.

Rose & Westra, Inc., Wolverine World Wide (WWW) – Former Rockford, Michigan Tannery – Round 2 Environmental Investigation, February 6, 2012.

United States Geological Survey, Cannonsburg Quadrangle, Mich., 7.5 minute series, 1972; Cedar Springs Quadrangle, Mich., 7.5 minute series, 1967, photorevised 1972; Cedar Springs SW Quadrangle, Mich., 7.5 minute series, 1967, photorevised 1972; Evans Quadrangle, Mich., 7.5 minute series, 1972, photorevised 1982; Rockford Quadrangle, Mich., 7.5 minute series, 1967, photorevised 1981; Sparta Quadrangle, Mich., 7.5 minute series , 1967, photorevised 1972.

FIGURES

Figure 1
Site Location



Legend

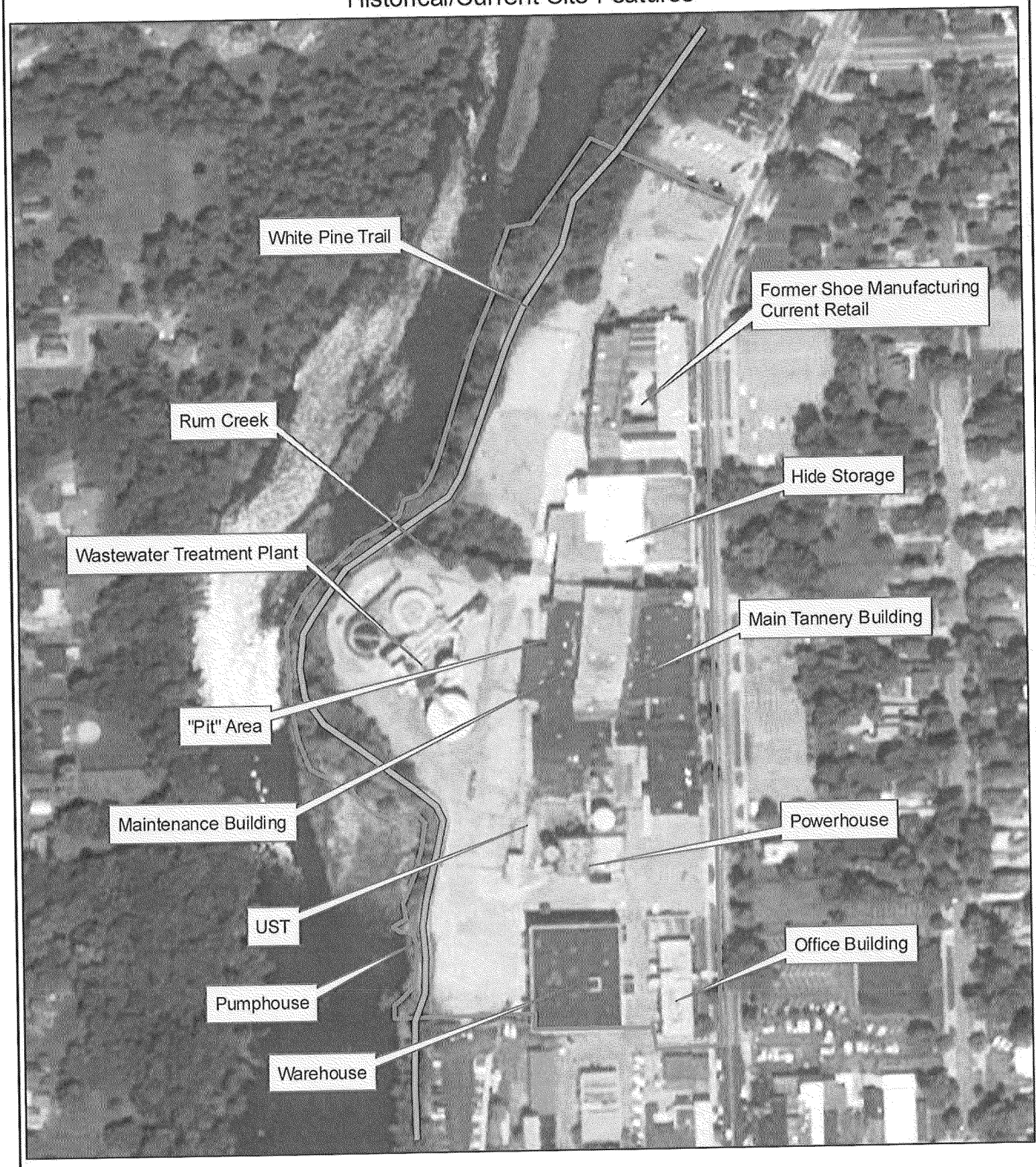
- Site Boundary
- Roads
- Water Bodies

N
W E
S

0 0.25 0.5 1 Miles

Compiled by: Leni L. Steiner-Zehender
June 2012
Source: Michigan Geographic Data Library

Figure 2
Historical/Current Site Features



Legend

White Pine Trail

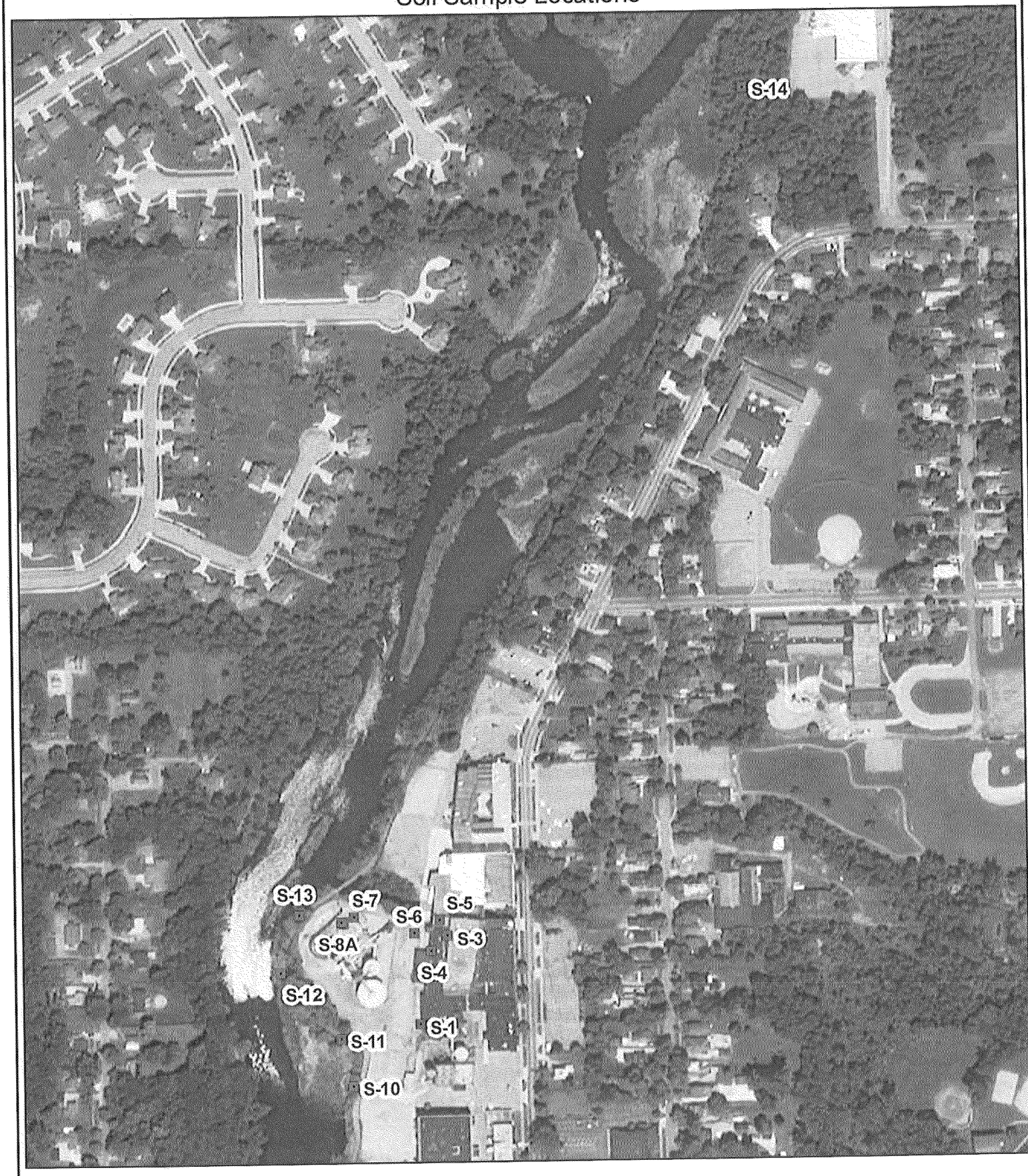
Site Boundary

N
W E
S

0 75 150 300 450 Feet

Compiled by: Leni Steiner-Zehender
June 2012
Source: Michigan Geographic Data Library

Figure 3
Soil Sample Locations



Legend

S-1 Soil Sample Locations

N
W E
S

0 125 250 500 750 Feet

Compiled by: Leni Steiner-Zehender
June 2012
Source: Michigan Geographic Data Library & GPS Data

Figure 4
Groundwater Sample Locations

0 25 50 100 150 200 Feet

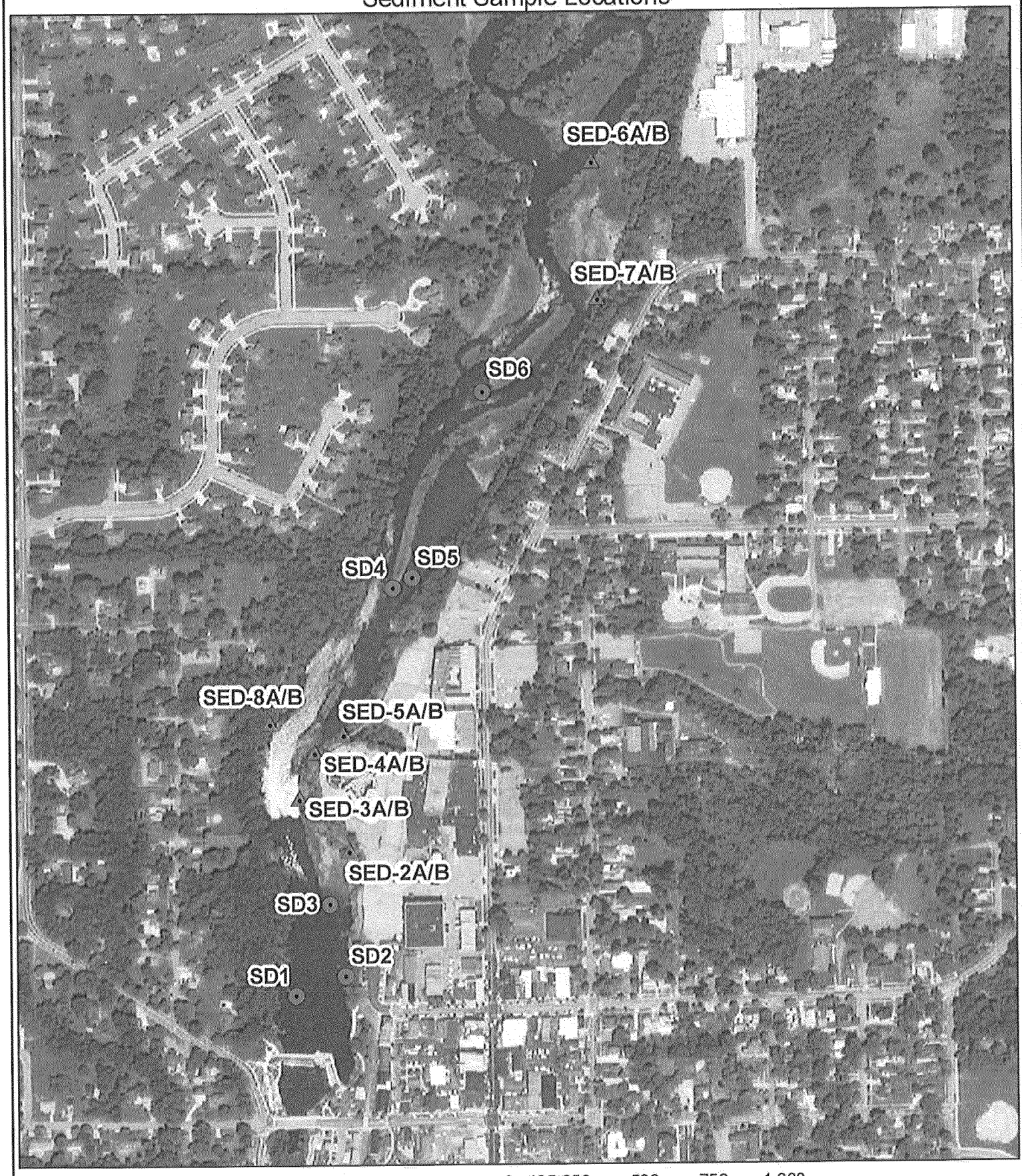
N
W E
S

Legend

- ⊙ MW-1 Monitoring Well Locations
- ⊙ P-1 & RP-01 Piezometer/River Piezometer Locations

Compiled by: Leni Steiner-Zehender
June 2012
Source: Michigan Geographic Data Library & GPS Data

Figure 5
Sediment Sample Locations



Legend

- Sediment Sample March 2012
- Sediment Sample December 2011

Compiled by: Leni Steiner-Zehender
June 2012
Source: Michigan Geographic Data Library & GPS Data

Figure 6
4 Mile Site Radius Map

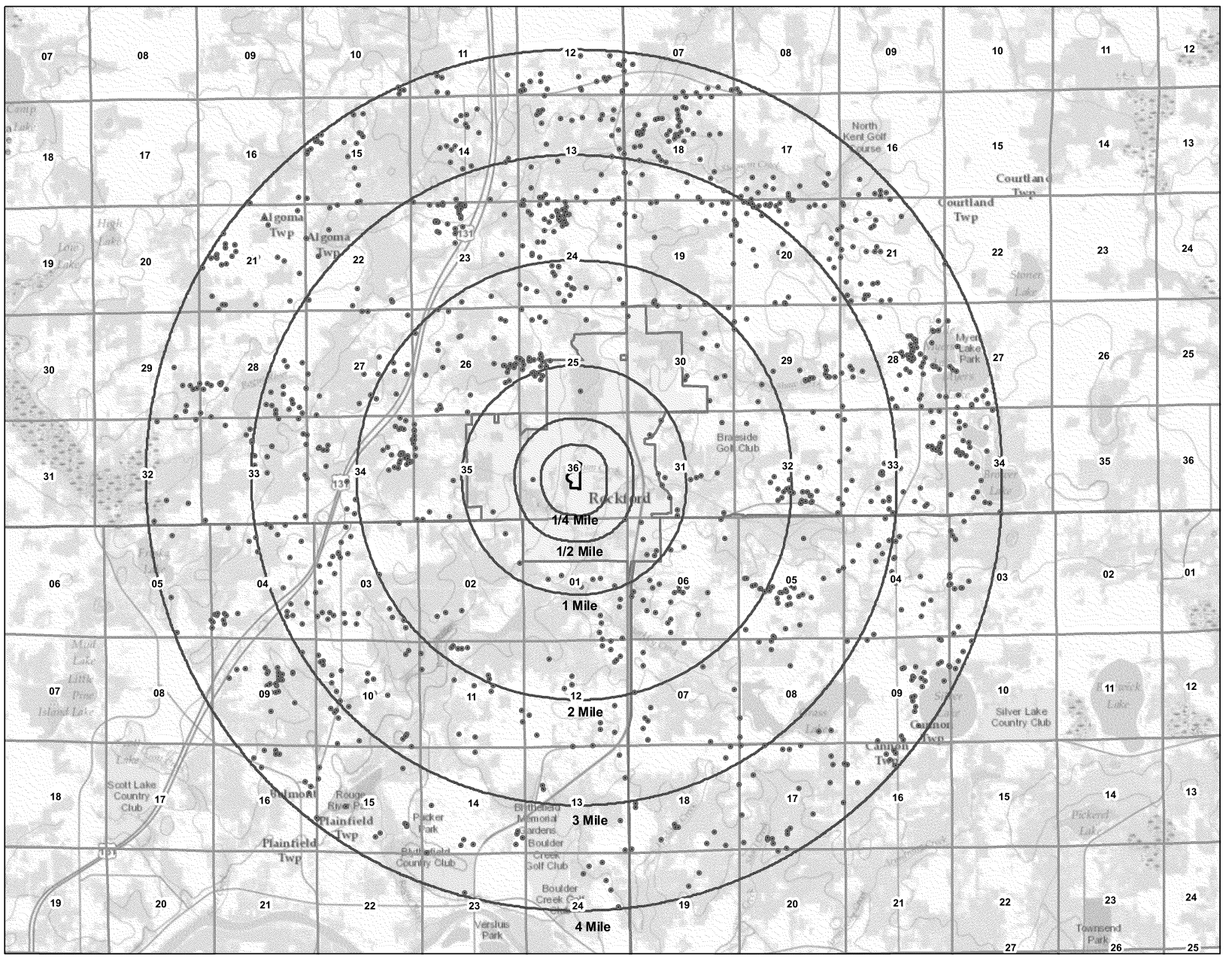
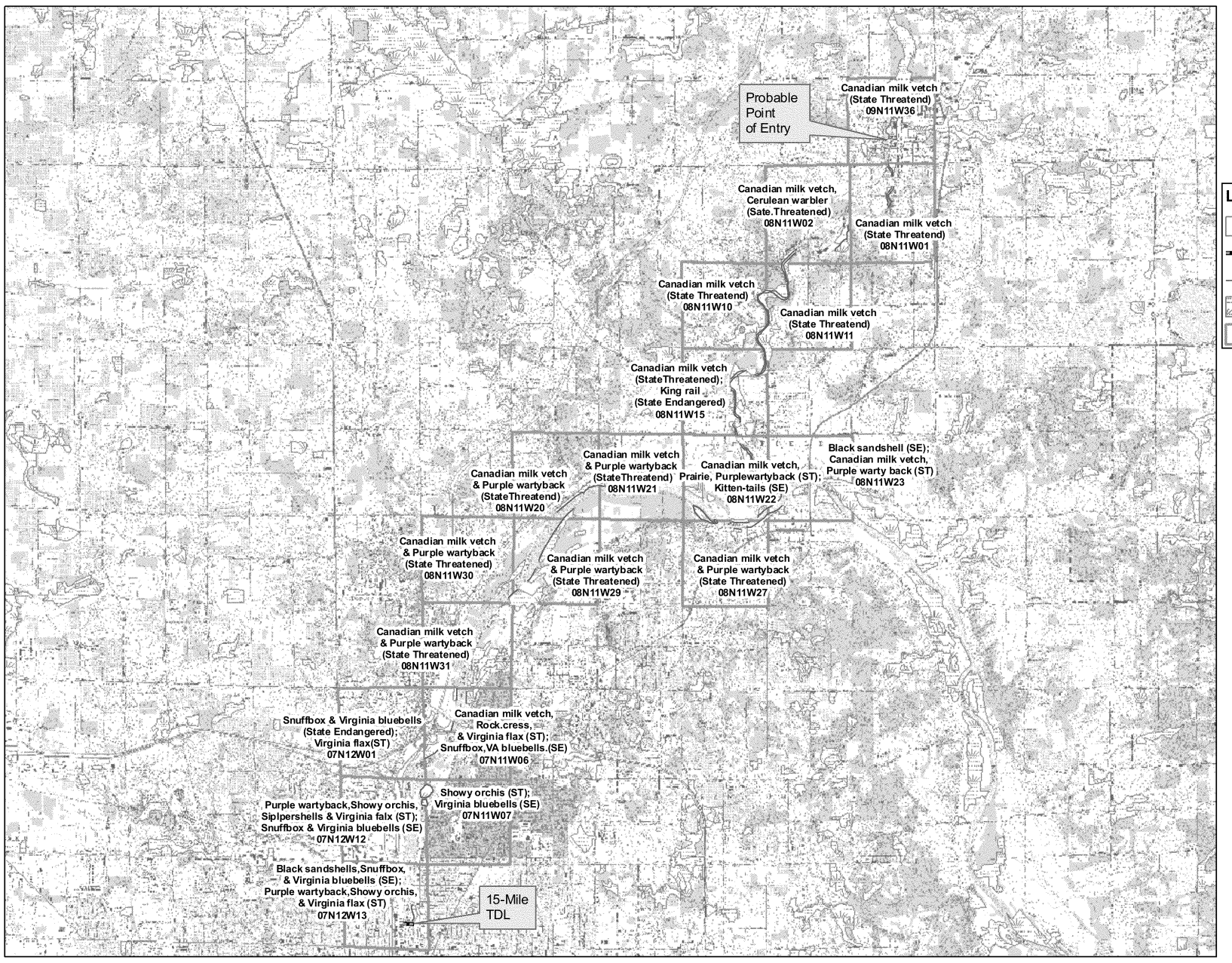


Figure 7
15 Mile
Target Distance Limit Map



Legend

- Site Boundary
- 15 Mile Target Distance Limit
- Wetland Frontage (14.45 Miles Total)
- National Wetlands Inventory
- MNFI - State Threatened & Endangered Species

0 0.5 1 2 Miles

N W E S

Compiled by: Leni Steiner-Zehender
June 2012
Source: Michigan Geographic Data Library & Michigan National Features Inventory

TABLES

TABLE 1

DEEP SOIL SAMPLE DATA SUMMARY

Wolverine World Wide Former Tannery

Overall Deep Soil Data Summary for WWW colleceted samples
Number of Samples: 12 Concentrations in micrograms per kilogram (ug/kg - parts per billion)
Analyses: VOA - 12 / SVOA - 12 / Inorganics - 12 / Ammonia, Cyanide, Sulfide - 8

Analyte/Compound	# of Detects	Lowest Conc. Detected	Highest Conc. Detected	Background Conc.	Part 201 Non-residential Direct Contact Criteria	Part 201 GSI Protection Criteria	# of Samples Exceeding Criteria
VOA							
1,2-Dichlorobenzene	1		2,300	50U	210,000	280	1
1,4-Dichlorobenzene	1		230	50U	1,900,000	360	
Ethylbenzene	1		120	50U	140,000	360	
2-Methylnaphthalene	1		470	250U	26,000,000	4,200	
Naphthalene	1		340	250U	52,000,000	730	
n-Propylbenzene	1		87	50U	8,000,000	---	
Toluene	1		380	50U	250,000	5,400	
1,2,3-Trimethylbenzene	1		160	50U	---	---	
1,2,4-Trimethylbenzene	1		220	50U	110,000	570	
1,3,5-Trimethylbenzene	1		62	50U	94,000	1,100	
Xylenes (total)	1		970	150U	150,000	820	

TABLE 1

DEEP SOIL SAMPLE DATA SUMMARY

Wolverine World Wide Former Tannery

Overall Deep Soil Data Summary for WWW colleceted samples
Number of Samples: 12 Concentrations in micrograms per kilogram (ug/kg - parts per billion)
Analyses: VOA - 12 / SVOA - 12 / Inorganics - 12 / Ammonia, Cyanide, Sulfide - 8

Analyte/Compound	# of Detects	Lowest Conc. Detected	Highest Conc. Detected	Background Conc.	Part 201 Non-residential Direct Contact Criteria	Part 201 GSI Protection Criteria	# of Samples Exceeding Criteria
SVOA							
Acenaphthene	2	340	500	330U	130,000,000	8,700	
Acenaphthylene	1		360	330U	5,200,000	---	
Anthracene	5	780	1,200	330U	730,000,000	---	
Benzo(a)anthracene	6	410	3,800	330U	80,000	---	
Benzo(a)pyrene	5	360	3,100	330U	8,000	---	
Benzo(b)fluoranthene	6	360	2,700	330U	80,000	---	
Benzo(g,h,i)Perylene	4	960	3,000	330U	7,000,000	---	
Benzo(k)fluoranthene	6	240	2,700	330U	800,000	---	
Benzoic acid	1		710	330U	1,000,000,000	---	
Chrysene	6	820	4,300	330U	8,000,000	---	
Dibenzofuran	1		500	330U	---	1,700	
Fluoranthene	5	1,700	7,800	330U	130,000,000	5,500	2
Fluorene	3	360	380	330U	87,000,000	5,300	
Indeno(1,2,3-cd)pyrene	5	450	2,100	330U	80,000	---	
2-Methylnaphthalene	1		800	330U	26,000,000	4,200	
Naphthalene	1		910	330U	52,000,000	730	
Phenanthrene	6	640	4,500	330U	5,200,000	2,100	4
Phenol	1		5,000	330U	12,000,000	9,000	
Pyrene	5	730	6,800	330U	84,000,000	---	

TABLE 1

DEEP SOIL SAMPLE DATA SUMMARY

Wolverine World Wide Former Tannery

Overall Deep Soil Data Summary for WWW colleceted samples
Number of Samples: 12 Concentrations in micrograms per kilogram (ug/kg - parts per billion)
Analyses: VOA - 12 / SVOA - 12 / Inorganics - 12 / Ammonia, Cyanide, Sulfide - 8

Analyte/Compound	# of Detects	Lowest Conc. Detected	Highest Conc. Detected	Background Conc.	Part 201 Non-residential Direct Contact Criteria	Part 201 GSI Protection Criteria	# of Samples Exceeding Criteria
Inorganics							
Arsenic	12	650	360,000	2,100	37,000	4,600	5
Barium	12	3,100	650,000	27,000	130,000,000	440,000	1
Cadmium	10	69	17,000	63	2,100,000	3,600	2
Calcium	12	160,000	120,000,000	1,200,000	---	---	
Chromium [total]	12	4,200	49,000,000	8,700	9,200,000	3,300	12
Hexavalent Chromium	7	1,100	17,000	500U	9,200,000	3,300	3
Copper	12	1,400	740,000	2,900	73,000,000	750,000	
Lead	11	3,400	930,000	5,000	900,000	2,800,000	1
Mercury [total]	8	56	630	50U	580,000	50; 1.2	8
Selenium	10	240	2,200	270	9,600,000	400	8
Silver	4	180	450	100U	9,000,000	100; 27	4
Zinc	12	3,800	1,000,000	14,000	630,000,000	170,000	3
Ammonia	7	4,100	950,000	No sample	---	580	7
Cyanide	5	120	8,300	No sample	250,000	100	5
Sulfide	6	4,600	7,600,000	No sample	---	---	

TABLE 1

DEEP SOIL SAMPLE DATA SUMMARY

Wolverine World Wide Former Tannery

Overall Deep Soil Data Summary for U.S. EPA split samples
Number of Samples: 11 Concentrations in ug/kg
Analyses: VOA - 10 / SVOA - 11 / Inorganics - 11

Analyte/Compound	# of Detects	Lowest Conc. Detected	Highest Conc. Detected	Background Conc.	Part 201 Non-residential Direct Contact Criteria	Part 201 GSI Protection Criteria	# of Samples Exceeding Screening Levels
VOA							
Acetone	3	150J	250J	140U	73,000,000	34,000	
Benzene	1		30J	55U	400,000	4,000	
n-Butylbenzene	2	11J	40J	55U	8,000,000	---	
sec-butylbenzene	1		16J	55U	8,000,000	---	
Carbon disulfide	1		53J	280U	280,000	---	
Cyclohexane	2	30J	79J	280U	---	---	
1,2-Dichlorobenzene	2	28J	1,900	110U	210,000	280	1
1,4-Dichlorobenzene	2	8.5J	390	110U	1,900,000	360	1
Ethylbenzene	1		15J	55U	140,000	360	
Isopropylbenzene	2	11J	13J	280U	390,000	3,200	
4-Isopropyltoluene	1		37J	110U	---	---	
n-Propylbenzene	1		19J	110U	8,000,000	---	
Toluene	7	10J	20J	110U	250,000	5,400	
Trichlorofluoromethane	3	14J	21J	110U	560,000	---	
1,2,4-Trimethylbenzene	2	64J	130	110U	110,000	570	
1,3,5-Trimethylbenzene	2	15J	28J	110U	94,000	1,100	
Xylenes (total)	3	170	320	110U	150,000	820	

TABLE 1

DEEP SOIL SAMPLE DATA SUMMARY

Wolverine World Wide Former Tannery

Overall Deep Soil Data Summary for U.S. EPA split samples
Number of Samples: 11 Concentrations in ug/kg
Analyses: VOA - 10 / SVOA - 11 / Inorganics - 11

Analyte/Compound	# of Detects	Lowest Conc. Detected	Highest Conc. Detected	Background Conc.	Part 201 Non-residential Direct Contact Criteria	Part 201 GSI Protection Criteria	# of Samples Exceeding Screening Levels
SVOA							
Acenaphthene	4	94J	960J	410U	130,000,000	8,700	
Acenaphthylene	4	23J	330J	410U	5,200,000	---	
Anthracene	7	82J	2,400J	410U	730,000,000	---	
Benzo(a)anthracene	8	18J	6.000J	410U	80,000	---	
Benzo(a)pyrene	7	15J	4,400J	410U	8,000	---	
Benzo(b)fluoranthene	8	16J	7,700J	2.8J	80,000	---	
Benzo(g,h,i)Perylene	8	8.7J	2,600J	2.4J	7,000,000	---	
Benzo(k)fluoranthene	8	13J	3,200J	2.4J	800,000	---	
Bis(2-ethylhexyl)phthalate	4	80J	7,500J	11J	10,000,000	---	
Butylbenzylphthalate	2	23J	59,000	2.8J	310,000	120,000	
Chrysene	10	15J	5,200J	2.0J	8,000,000	---	
Dibenz(a,h)anthracene	4	140J	1,300J	410U	8,000	---	
Dibenzofuran	5	39J	760J	410U	---	1,700	
1,4-dichlorobenzene	1		31J	410U	360	1,900,000	
Fluoranthene	8	19J	13,000	410U	130,000,000	5,500	1
Fluorene	6	31J	1,500J	410U	87,000,000	5,300	
Indeno(1,2,3-cd)pyrene	7	7.7J	2,500J	410U	80,000	---	

TABLE 1

DEEP SOIL SAMPLE DATA SUMMARY

Wolverine World Wide Former Tannery

Overall Deep Soil Data Summary for U.S. EPA split samples
Number of Samples: 11 Concentrations in ug/kg
Analyses: VOA - 10 / SVOA - 11 / Inorganics - 11

Analyte/Compound	# of Detects	Lowest Conc. Detected	Highest Conc. Detected	Background Conc.	Part 201 Non-residential Direct Contact Criteria	Part 201 GSI Protection Criteria	# of Samples Exceeding Screening Levels
SVOA							
2-Methylnaphthalene	5	47J	320J	410U	26,000,000	4,200	
Naphthalene	8	27J	510J	410U	52,000,000	730	
N-nitroso-diphenylamine	1		640J	410U	7,800,000	---	
Phenanthrene	7	460J	11,000	410U	5,200,000	2,100	1
Pyrene	10	26J	14,000	2.8J	84,000,000	---	
Inorganics							
Arsenic	11	2,900	14,000	1,800J	37,000	4,600	8
Barium	11	11,000	190,000	30,000	130,000,000	440,000	
Cadmium	11	80	1,300	59J	2,100,000	3,600	
Calcium	11	1,000,000	78,000,000	1,200,000	---	---	
Chromium [total]	11	5,800	480,000	6,100	9,200,000	3,300	11
Hexavalent Chromium	11	290J	6,300	2,500U	9,200,000	3,300	3
Copper	11	3,000	76,000	3,300	73,000,000	750,000	
Lead	11	5,300	260,000	4,300J	900,000	2,800,000	
Mercury [total]	11	10J	640	9.4J	580,000	50; 1.2	7
Selenium	8	260	1,700	400	9,600,000	400	7
Silver	11	15J	310	10J	9,000,000	100; 27	3
Zinc	11	18,000	430,000	16,000	630,000,000	170,000	1

TABLE 1

DEEP SOIL SAMPLE DATA SUMMARY

Wolverine World Wide Former Tannery

Overall Deep Soil Data Summary for U.S. EPA split samples
Number of Samples: 11 Concentrations in ug/kg
Analyses: VOA - 10 / SVOA - 11 / Inorganics - 11

Analyte/Compound	# of Detects	Lowest Conc. Detected	Highest Conc. Detected	Background Conc.	Part 201 Non-residential Direct Contact Criteria	Part 201 GSI Protection Criteria	# of Samples Exceeding Screening Levels
Inorganics							
Ammonia	11	9,190	556,000	39,200	---	580	11
Cyanide	8	38J	550	43J	250,000	100	4
Sulfide	5	32,000	200,000	12,000U	---	---	

J - Estimated concentration.
U - Non-detect at reported detection limit.
--- - No criteria available.

TABLE 2

SURFICIAL SOIL SAMPLE DATA SUMMARY

Wolverine World Wide Former Tannery

Overall Surficial Soil Data Summary for WWW colleceted samples
Number of Samples: 4 Concentrations in ug/kg
Analyses: VOA - 4 / SVOA - 4 / Inorganics - 4

Analyte/Compound	# of Detects	Lowest Conc. Detected	Highest Conc. Detected	Background Conc.	Part 201 Non-residential Direct Contact Criteria	Part 201 GSI Protection Criteria	# of Samples Exceeding Criteria
VOA							
No detections							
SVOA							
Anthracene	2	460	680	330U	730,000,000	---	
Benzo(a)anthracene	2	2,000	2,700	330U	80,000	---	
Benzo(a)pyrene	2	2,000	2,500	330U	8,000	---	
Benzo(b)fluoranthene	2	1,800	2,400	330U	80,000	---	
Benzo(g,h,i)Perylene	2	1,300	1,600	330U	7,000,000	---	
Benzo(k)fluoranthene	2	1,800	2,100	330U	800,000	---	
Chrysene	2	2,500	3,200	330U	8,000,000	---	
Fluoranthene	3	480	5,800	330U	130,000,000	5,500	2
Indeno(1,2,3-cd)pyrene	2	1,100	1,400	330U	80,000	---	
Phenanthrene	3	360	3,300	330U	5,200,000	2,100	2
Pyrene	3	450	5,100	330U	84,000,000	---	

TABLE 2

SURFICIAL SOIL SAMPLE DATA SUMMARY

Wolverine World Wide Former Tannery

Overall Surficial Soil Data Summary for WWW colleceted samples
Number of Samples: 4 Concentrations in ug/kg
Analyses: VOA - 4 / SVOA - 4 / Inorganics - 4

Analyte/Compound	# of Detects	Lowest Conc. Detected	Highest Conc. Detected	Background Conc.	Part 201 Non-residential Direct Contact Criteria	Part 201 GSI Protection Criteria	# of Samples Exceeding Criteria
Inorganics							
Arsenic	4	3,600	11,000	2,500	37,000	4,600	3
Barium	4	50,000	120,000	30,000	130,000,000	440,000	
Cadmium	4	130	860	180	2,100,000	3,600	
Calcium	4	13,000,000	37,000,000	2,200,000	---	---	
Chromium [total]	4	65,000	180,000	6,800	9,200,000	3,300	4
Hexavalent Chromium	3	540	1,400	500U	9,200,000	3,300	
Copper	4	15,000	31,000	4,500	73,000,000	750,000	
Lead	4	14,000	170,000	35,000	900,000	2,800,000	
Mercury [total]	3	88	320	50U	580,000	50; 1.2	3
Selenium	4	210	490	330	9,600,000	400	2
Silver	2	100	150	100U	9,000,000	100; 27	1
Zinc	4	42,000	210,000	81,000	630,000,000	170,000	1

TABLE 2

SURFICIAL SOIL SAMPLE DATA SUMMARY

Wolverine World Wide Former Tannery

Overall Surficial Soil Data Summary for U.S. EPA split samples
Number of Samples: 4 Concentrations in ug/kg
Analyses: VOA - 4 / SVOA - 4 / Inorganics - 4

Analyte/Compound	# of Detects	Lowest Conc. Detected	Highest Conc. Detected	Background Conc.	Part 201 Non-residential Direct Contact Criteria	Part 201 GSI Protection Criteria	# of Samples Exceeding Criteria
VOA							
Toluene	3	11J	19J	150U	250,000	5,400	
Trichlorofluoromethane	2	19J	20J	150U	560,000	---	
1,2,4-Trimethylbenzene	1		7.4J	150U	110,000	570	
Xylenes (total)	1		14J	150U	150,000	820	
SVOA							
Acenaphthene	3	43J	240J	430U	130,000,000	8,700	
Acenaphthylene	4	22J	250J	430U	5,200,000	---	
Anthracene	4	49J	650J	3.1J	730,000,000	---	
Benzo(a)anthracene	4	250J	3,700	2.3J	80,000	---	
Benzo(a)pyrene	4	250J	2,400	15J	8,000	---	
Benzo(b)fluoranthene	4	400J	4,900	42J	80,000	---	
Benzo(g,h,i)Perylene	4	150J	1,600J	14J	7,000,000	---	
Benzo(k)fluoranthene	4	120J	1,300J	11J	800,000	---	
Bis(2-ethylhexyl)phthalate	2	45J	210J	27J	10,000,000	---	
Butylbenzylphthalate	4	13J	23J	430U	310,000	120,000	
Chrysene	4	220J	2,500	19J	8,000,000	---	
Dibenz(a,h)anthracene	2	320J	720J	430U	8,000	---	
Dibenzofuran	3	34J	150J	430U	---	1,700	
Fluoranthene	4	420J	4,800	31J	130,000,000	5,500	
Fluorene	4	18J	340J	430U	87,000,000	5,300	

TABLE 2

SURFICIAL SOIL SAMPLE DATA SUMMARY

Wolverine World Wide Former Tannery

Overall Surficial Soil Data Summary for U.S. EPA split samples
Number of Samples: 4 Concentrations in ug/kg
Analyses: VOA - 4 / SVOA - 4 / Inorganics - 4

Analyte/Compound	# of Detects	Lowest Conc. Detected	Highest Conc. Detected	Background Conc.	Part 201 Non-residential Direct Contact Criteria	Part 201 GSI Protection Criteria	# of Samples Exceeding Criteria
SVOA							
Indeno(1,2,3-cd)pyrene	4	150J	2,000J	11J	80,000	---	
2-Methylnaphthalene	4	5.9J	74J	8.8J	26,000,000	4,200	
Naphthalene	4	12J	110J	5.7J	52,000,000	730	
Phenanthrene	4	190J	3,600	21J	5,200,000	2,100	1
Pyrene	4	400J	5,900	37J	84,000,000	---	
Inorganics							
Arsenic	4	4,600	9,000	2,200	37,000	4,600	3
Barium	4	40,000	130,000	27,000	130,000,000	440,000	
Cadmium	4	180	800	170	2,100,000	3,600	
Calcium	4	11,000,000	56,000,000	1,600,000	---	---	
Chromium [total]	4	22,000	120,000	4,600	9,200,000	3,300	4
Hexavalent Chromium	2	360J	1,400J	2,600U	9,200,000	3,300	
Copper	4	12,000	33,000	3,100	73,000,000	750,000	
Lead	4	24,000	160,000	31,000	900,000	2,800,000	
Mercury [total]	4	40J	340	19J	580,000	50; 1.2	3
Selenium	4	620	1,200	340	9,600,000	400	4
Silver	4	41J	110	18J	9,000,000	100; 27	1
Zinc	4	65,000	200,000	71,000	630,000,000	170,000	1
Ammonia	4	102,000	316,000	332,000	---	580	4
Cyanide	4	71J	410	150	250,000	100	2

TABLE 2

SURFICIAL SOIL SAMPLE DATA SUMMARY

Wolverine World Wide Former Tannery

Analyte/Compound	# of Detects	Lowest Conc. Detected	Highest Conc. Detected	Background Conc.	Part 201 Non-residential Direct Contact Criteria	Part 201 GSI Protection Criteria	# of Samples Exceeding Criteria

J - Estimated concentration.
U - Non-detect at reported detection limit.
--- - No criteria available.

TABLE 3

GROUNDWATER SAMPLE DATA SUMMARY

Wolverine World Wide Former Tannery

Overall Groundwater Data Summary for WWW colleceted samples
Number of Samples: 9 Concentrations in micrograms per liter (ug/l - parts per billion)
Analyses: VOA - 3 / SVOA - 3 / Inorganics - 3 / Ammonia, Arsenic, Cyanide - 6

Analyte/Compound	# of Detects	Lowest Conc. Detected	Highest Conc. Detected	Background Conc.	Part 201 Residential Drinking Water Criteria	Part 201 GSI Criteria	# of Samples Exceeding Criteria
VOA							
1,1-Dichloroethane	1		3	NA	880	740	
SVOA							
4-Chloro-3-methylphenol	1		9	NA	150	7	1
Phenol	1		12	NA	4,400	450	
Inorganics							
Arsenic	7	2	30	NA	10	10	2
Boron	3	210	770	NA	500	5,000	1
Cadmium	1		0.3	NA	5	3	
Chromium [total]	2	19	54	NA	100	11	2
Hexavalent Chromium	2	10	85	NA	100	11	1
Copper	2	4	6	NA	1,000	13	
Iron	3	490	9,800	NA	300	---	3
Magnesium	3	28,000	36,000	NA	400,000	---	
Molybdenum	1		50	NA	73	3,200	
Nickel	1		30	NA	100	73	
Sodium	3	90,000	310,000	NA	120,000	---	2
Vanadium	1		9	NA	5	12	1
Zinc	1		10	NA	2,400	170	

TABLE 3

GROUNDWATER SAMPLE DATA SUMMARY

Wolverine World Wide Former Tannery

Overall Groundwater Data Summary for WWW colleceted samples
Number of Samples: 9 Concentrations in micrograms per liter (ug/l - parts per billion)
Analyses: VOA - 3 / SVOA - 3 / Inorganics - 3 / Ammonia, Arsenic, Cyanide - 6

Analyte/Compound	# of Detects	Lowest Conc. Detected	Highest Conc. Detected	Background Conc.	Part 201 Residential Drinking Water Criteria	Part 201 GSI Criteria	# of Samples Exceeding Criteria
Acetate	3	1,300	3,800	NA	4,200	7,700	
Ammonia	9	290	46,000	NA	10,000	29	9
Chloride	3	97,000	480,000	NA	250,000	---	1
Cyanide	3	5	16	NA	200	5.2	2
Formate	1		500	NA	---	---	
Nitrate	1		490	NA	10,000	---	
Nitrite	1		780	NA	1,000	---	
Phosphorus (total)	2	120	430	NA	63,000	1,000	
Sulfates	3	190,000	500,000	NA	250,000	---	2

J - Estimated concentration.
U - Non-detect at reported detection limit.
NA - Not available.
--- - No criteria available.

TABLE 4

SEDIMENT SAMPLE DATA SUMMARY

Wolverine World Wide Former Tannery

Overall Sediment Data Summary for WWW colleceted samples
Number of Samples: 12 Concentrations in ug/kg
Analyses: VOA - 12 / SVOA - 12 / Inorganics - 12

Analyte/Compound	# of Detects	Lowest Conc. Detected	Highest Conc. Detected	Background Conc.	Part 201 Sediment Screening Level-Lowest	Part 201 Sediment Screening Level-Highest	# of Samples Exceeding Criteria
Inorganics							
Arsenic	12	3,700	10,000	3,000	5,900	85,000	10
Barium	12	27,000	160,000	38,000	---	---	
Cadmium	12	200	1,200	110	580	10,000	6
Calcium	12	18,000,000	120,000,000	10,000,000	---	---	
Chromium [total]	12	18,000	520,000	7,600	26,000	145,000	10
Hexavalent Chromium	10	510	6,200	500U	---	---	
Copper	12	5,600	66,000	4,300	16,000	390,000	4
Lead	12	10,000	130,000	4,500	31,000	250,000	7
Mercury [total]	9	120	1,600	50U	150	2,000	6
Zinc	12	29,000	210,000	19,000	98,000	820,000	5

TABLE 4

SEDIMENT SAMPLE DATA SUMMARY

Wolverine World Wide Former Tannery

Overall Sediment Data Summary for U.S. EPA split samples
Number of Samples: 12 Concentrations in ug/kg
Analyses: VOA - 12 / SVOA - 12 / Inorganics - 12

Analyte/Compound	# of Detects	Lowest Conc. Detected	Highest Conc. Detected	Background Conc.	Part 201 Sediment Screening Level Lowest	Part 201 Sediment Screening Level Highest	# of Samples Exceeding Level
Inorganics							
Arsenic	12	3,300	12,000	3,000	5,900	85,000	7
Barium	12	21,000	140,000	33,000	---	---	
Cadmium	12	180	1,300	170	580	10,000	5
Calcium	12	15,000,000	130,000,000	9,500,000	---	---	
Chromium [total]	12	14,000	450,000	6,300	26,000	145,000	7
Hexavalent Chromium	6	500J	1,200J	1,100J	---	---	
Copper	12	3,400	50,000	2,700	16,000	390,000	3
Lead	12	9,600	92,000	4,500	31,000	250,000	5
Mercury [total]	12	35J	2,100	22J	150	2,000	7
Zinc	12	26,000	290,000	22,000	98,000	820,000	5

TABLE 4

SEDIMENT SAMPLE DATA SUMMARY

Wolverine World Wide Former Tannery

Overall Sediment Data Summary for MDEQ collected samples
Number of Samples: 10 Concentrations in ug/kg
Analyses: PCB - 4 / SVOA - 5 / Inorganics - 10

Analyte/Compound	# of Detects	Lowest Conc. Detected	Highest Conc. Detected	Background Conc.	Part 201 Sediment Screening Level Lowest	Part 201 Sediment Screening Level Highest	# of Samples Exceeding Level
PCB							
No PCBs detected							
SVOA							
Fluoranthene	2	360	620	NA	31	10,200	2
Pyrene	2	330	550	NA	44	8,500	2
Inorganics							
Arsenic	10	2,400	16,000	3,000	5,900	85,000	2
Barium	10	12,000	99,000	38,000	---	---	
Cadmium	8	220	700	170	580	10,000	3
Calcium	10	20,000,000	91,000,000	10,000,000	---	---	
Chromium [total]	10	5,700	430,000	7,600	26,000	145,000	3
Hexavalent Chromium	1		390J	1,100J	---	---	
Copper	10	2,000	15,000	4,300	16,000	390,000	
Lead	10	2,500	30,000	4,500	31,000	250,000	
Mercury [total]	6	180	5,100	22J	150	2,000	6
Selenium	10	230	1,200	NA	---	---	
Silver	3	140	230	NA	---	---	
Zinc	10	16,000	92,000	2,200	98,000	820,000	

TABLE 4

SEDIMENT SAMPLE DATA SUMMARY

Wolverine World Wide Former Tannery

Analyte/Compound	# of Detects	Lowest Conc. Detected	Highest Conc. Detected	Background Conc.	Part 201 Sediment Screening Level Lowest	Part 201 Sediment Screening Level Highest	# of Samples Exceeding Level

J - Estimated concentration.
U - Non-detect at reported detection limit.
NA - Not available.
--- - No criteria available.

APPENDIX A

PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS

Attachment 1
TABLE 1. GROUNDWATER: RESIDENTIAL AND NONRESIDENTIAL PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS; PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per liter (ug/L). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic groundwater criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based or solubility value, whichever is lower (R299.5708). Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

Guidesheet Number →		#1	#2	#3	#4	#5	#6	#7	#8	#9
Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria & RBSLs	Nonresidential Drinking Water Criteria & RBSLs	Groundwater Surface Water Interface Criteria & RBSLs	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Groundwater Contact Criteria & RBSLs	Water Solubility	Flammability and Explosivity Screening Level	Acute Inhalation Screening Level
Acenaphthene	83329	1,300	3,800	38	4,200 (S)	4,200 (S)	4,200 (S)	4,240	ID	ID
Acenaphthylene	208968	52	150	ID	3,900 (S)	3,900 (S)	3,900 (S)	3,930	ID	ID
Acetaldehyde (I)	75070	950	2,700	130	1.1E+6	2.3E+6	4.2E+7	1.0E+9	8.9E+6	2.6E+7
Acetate	71501	4,200	12,000	(G)	ID	ID	ID	ID	ID	ID
Acetic acid	64197	4,200	12,000	(G)	NLV	NLV	1.8E+8	6.0E+9	1.0E+9 (D)	1.0E+9 (D)
Acetone (I)	67641	730	2,100	1,700	1.0E+9 (D,S)	1.0E+9 (D,S)	3.1E+7	1.0E+9	1.5E+7	1.0E+9 (D)
Acetonitrile	75058	140	400	NA	2.4E+7	4.5E+7	5.6E+6	2.00E+8	2.1E+7	2.0E+8
Acetophenone	98862	1,500	4,400	ID	6.1E+6 (S)	6.1E+6 (S)	6.1E+6 (S)	6.1E+6	ID	ID
Acrolein (I)	107028	120	330	NA	2,100	4,200	3.4E+6	2.10E+8	6.7E+6	3.4E+5
Acrylamide	79061	0.5 (A)	0.5 (A)	10 (X)	NLV	NLV	13,000	2.20E+9	NA	ID
Acrylic acid	79107	3,900	11,000	NA	1.2E+7	2.8E+7	7.6E+7	1.0E+9	1.0E+9 (D)	ID
Acrylonitrile (I)	107131	2.6	11	2.0 (M); 1.2	34,000	1.9E+5	14,000	7.50E+7	6.4E+6	ID
Alachlor	15972608	2.0 (A)	2.0 (A)	11 (X)	NLV	NLV	1,700	1.83E+5	ID	ID
Aldicarb	116063	3.0 (A)	3.0 (A)	NA	NLV	NLV	1.2E+5	6.00E+6	ID	ID
Aldicarb sulfone	1646884	2.0 (A)	2.0 (A)	NA	NLV	NLV	2.1E+6	7.80E+6	ID	ID
Aldicarb sulfoxide	1646873	4.0 (A)	4.0 (A)	NA	NLV	NLV	2.7E+6	2.80E+7	ID	ID
Aldrin	309002	0.098	0.4	0.01 (M); 8.7E-6	180 (S)	180 (S)	0.34 (AA)	180	ID	ID
Aluminum (B)	7429905	50 (V)	50 (V)	NA	NLV	NLV	6.4E+7	NA	ID	ID
Ammonia	7664417	10,000 (N)	10,000 (N)	(CC)	3.2E+6	7.1E+6	ID	5.30E+8	ID	3.5E+6
t-Amyl methyl ether (TAME)	994058	190 (E)	190 (E)	NA	2.6E+5	5.7E+5	2.6E+6 (S)	2.64E+6	NA	NA
Aniline	62533	53	220	4.0	NLV	NLV	1.4E+5	3.60E+7	NA	ID

Attachment 1
TABLE 1. GROUNDWATER: RESIDENTIAL AND NONRESIDENTIAL PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS; PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per liter (ug/L). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic groundwater criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based or solubility value, whichever is lower (R299.5708). Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

Guidesheet Number →		#1	#2	#3	#4	#5	#6	#7	#8	#9
Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria & RBSLs	Nonresidential Drinking Water Criteria & RBSLs	Groundwater Surface Water Interface Criteria & RBSLs	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Groundwater Contact Criteria & RBSLs	Water Solubility	Flammability and Explosivity Screening Level	Acute Inhalation Screening Level
Anthracene	120127	43 (S)	43 (S)	ID	43 (S)	43 (S)	43 (S)	43.4	ID	ID
Antimony	7440360	6.0 (A)	6.0 (A)	130 (X)	NLV	NLV	68,000	NA	ID	ID
Arsenic	7440382	10 (A)	10 (A)	10	NLV	NLV	4,300	NA	ID	ID
Asbestos (BB)	1332214	7.0E+6 f/ml (A)	7.0E+6 f/ml (A)	NA	NLV	NLV	ID	NA	NA	ID
Atrazine	1912249	3.0 (A)	3.0 (A)	7.3	NLV	NLV	5,400	70,000	ID	ID
Azobenzene	103333	23	94	ID	6,400 (S)	6,400 (S)	1,600	6,400	ID	ID
Barium (B)	7440393	2,000 (A)	2,000 (A)	(G)	NLV	NLV	1.4E+7	NA	ID	ID
Benzene (I)	71432	5.0 (A)	5.0 (A)	200 (X)	5,600	35,000	11,000	1.75E+6	68,000	67,000
Benzidine	92875	0.3 (M); 0.0037	0.3 (M); 0.015	0.3 (M); 0.073	NLV	NLV	7.1	5.20E+5	ID	ID
Benzo(a)anthracene (Q)	56553	2.1	8.5	ID	NLV	NLV	9.4 (S,AA)	9.4	ID	ID
Benzo(b)fluoranthene (Q)	205992	1.5 (S,AA)	1.5 (S,AA)	ID	ID	ID	1.5 (S,AA)	1.5	ID	ID
Benzo(k)fluoranthene (Q)	207089	1.0 (M); 0.8 (S)	1.0 (M); 0.8 (S)	NA	NLV	NLV	1.0 (M,AA); 0.8 (S)	0.8	ID	ID
Benzo(g,h,i)perylene	191242	1.0 (M); 0.26 (S)	1.0 (M); 0.26 (S)	ID	NLV	NLV	1.0 (M,AA); 0.26 (S)	0.26	ID	ID
Benzo(a)pyrene (Q)	50328	5.0 (A)	5.0 (A)	ID	NLV	NLV	1.0 (M,AA); 0.64	1.62	ID	ID
Benzoic acid	65850	32,000	92,000	NA	NLV	NLV	3.5E+6 (S)	3.50E+6	ID	ID
Benzyl alcohol	100516	10,000	29,000	NA	NLV	NLV	4.4E+7 (S)	4.40E+7	ID	ID
Benzyl chloride	100447	7.7	32	NA	12,000	77,000	3,600	4.90E+5	NA	ID
Beryllium	7440417	4.0 (A)	4.0 (A)	(G)	NLV	NLV	2.9E+5	NA	ID	ID
bis(2-Chloroethoxy)ethane	112265	ID	ID	ID	NLV	NLV	ID	1.89E+7	ID	ID
bis(2-Chloroethyl)ether (I)	111444	2.0	8.3	1.0 (M); 0.79	38,000	2.1E+5	5,700	1.72E+7	1.7E+7 (S)	1.7E+7 (S)
bis(2-Ethylhexyl)phthalate	117817	6.0 (A)	6.0 (A)	25	NLV	NLV	320 (AA)	340	NA	340 (S)

Attachment 1

TABLE 1. GROUNDWATER: RESIDENTIAL AND NONRESIDENTIAL PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS; PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs) DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per liter (ug/L). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic groundwater criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based or solubility value, whichever is lower (R299.5708). Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

Guidesheet Number ⟶		#1	#2	#3	#4	#5	#6	#7	#8	#9
Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria & RBSLs	Nonresidential Drinking Water Criteria & RBSLs	Groundwater Surface Water Interface Criteria & RBSLs	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Groundwater Contact Criteria & RBSLs	Water Solubility	Flammability and Explosivity Screening Level	Acute Inhalation Screening Level
Boron (B)	7440428	500 (F)	500 (F)	5,000 (X)	NLV	NLV	6.2E+7	NA	ID	ID
Bromate	15541454	10 (A)	10 (A)	40 (X)	NLV	NLV	4,800	38,000	ID	ID
Bromobenzene (I)	108861	18	50	NA	1.8E+5	3.9E+5	12,000	4.13E+5	ID	ID
Bromodichloromethane	75274	80 (A,W)	80 (A,W)	ID	4,800	37,000	14,000	6.74E+6	ID	ID
Bromoform	75252	80 (A,W)	80 (A,W)	ID	4.7E+5	3.1E+6 (S)	1.4E+5	3.10E+6	ID	ID
Bromomethane	74839	10	29	35	4,000	9,000	70,000	1.45E+7	ID	ID
n-Butanol (I)	71363	950	2,700	NA	NLV	NLV	8.8E+6	7.40E+7	4.7E+7	7.4E+7 (S)
2-Butanone (MEK) (I)	78933	13,000	38,000	2,200	2.4E+8 (S)	2.4E+8 (S)	2.4E+8 (S)	2.40E+8	ID	2.4E+8 (S)
n-Butyl acetate	123864	550	1,600	NA	6.7E+6 (S)	6.7E+6 (S)	1.8E+6	6.70E+6	2.5E+6	6.7E+6 (S)
t-Butyl alcohol	75650	3,900	11,000	NA	1.0E+9 (D,S)	1.0E+9 (D,S)	7.9E+7	1.0E+9	6.1E+7	ID
Butyl benzyl phthalate	85687	1,200	2,700 (S)	67 (X)	NLV	NLV	2,700 (S)	2,690	ID	ID
n-Butylbenzene	104518	80	230	ID	ID	ID	5,900	NA	ID	ID
sec-Butylbenzene	135988	80	230	ID	ID	ID	4,400	NA	ID	ID
t-Butylbenzene (I)	98066	80	230	ID	ID	ID	8,900	NA	ID	ID
Cadmium (B)	7440439	5.0 (A)	5.0 (A)	(G,X)	NLV	NLV	1.9E+5	NA	ID	ID
Camphene (I)	79925	ID	ID	NA	440	1,000	ID	33,400	ID	ID
Caprolactam	105602	5,800	17,000	NA	NLV	NLV	3.9E+8	5.25E+9	NA	1.0E+9 (D)
Carbaryl	63252	700	2,000	NA	ID	ID	1.3E+5 (S)	1.26E+5	ID	ID
Carbazole	86748	85	350	10 (M); 4.0	NLV	NLV	7,400	7,480	ID	ID
Carbofuran	1563662	40 (A)	40 (A)	NA	NLV	NLV	3.4E+5	7.00E+5	ID	ID
Carbon disulfide (I,R)	75150	800	2,300	ID	2.5E+5	5.5E+5	1.2E+6 (S)	1.19E+6	13,000	ID

Attachment 1
TABLE 1. GROUNDWATER: RESIDENTIAL AND NONRESIDENTIAL PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS; PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per liter (ug/L). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic groundwater criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based or solubility value, whichever is lower (R299.5708). Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

Guidesheet Number →		#1	#2	#3	#4	#5	#6	#7	#8	#9
Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria & RBSLs	Nonresidential Drinking Water Criteria & RBSLs	Groundwater Surface Water Interface Criteria & RBSLs	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Groundwater Contact Criteria & RBSLs	Water Solubility	Flammability and Explosivity Screening Level	Acute Inhalation Screening Level
Carbon tetrachloride	56235	**5.0 (A)**	5.0 (A)	45 (X)	370	2,400	4,600	7.93E+5	ID	96,000
Chlordane (J)	57749	2.0 (A)	2.0 (A)	2.0 (M); 0.00025	56 (S)	56 (S)	15 (AA)	56	ID	ID
Chloride	16887006	2.5E+5 (E)	2.5E+5 (E)	(FF)	NLV	NLV	ID	NA	ID	ID
Chlorobenzene (I)	108907	100 (A)	100 (A)	25	2.1E+5	4.7E+5 (S)	86,000	4.72E+5	1.6E+5	ID
p-Chlorobenzene sulfonic acid	98668	7,300	21,000	ID	ID	ID	ID	NA	ID	ID
1-Chloro-1,1-difluoroethane	75683	15,000	44,000	NA	3.9E+6 (S)	3.9E+6 (S)	3.9E+6 (S)	3.9E+06	NA	ID
Chloroethane	75003	430	1,700	1,100 (X)	5.7E+6 (S)	5.7E+6 (S)	4.4E+5	5.74E+6	1.1E+5	ID
2-Chloroethyl vinyl ether	110758	ID	ID	NA	ID	ID	ID	1.50E+7	ID	ID
Chloroform	67663	**80 (A,W)**	80 (A,W)	350	28,000	1.8E+5	1.5E+5	7.92E+6	ID	ID
Chloromethane (I)	74873	260	1,100	ID	8,600	45,000	4.9E+5	6.34E+6	36,000	2.1E+5
4-Chloro-3-methylphenol	59507	150	420	**7.4**	NLV	NLV	79,000	3.90E+6	ID	ID
beta-Chloronaphthalene	91587	1,800	5,200	NA	ID	ID	6,700 (S)	6,740	ID	ID
2-Chlorophenol	95578	45	130	**18**	4.9E+5	1.1E+6	94,000	2.20E+7	ID	ID
o-Chlorotoluene (I)	95498	150	420	ID	2.2E+5	3.7E+5 (S)	44,000	3.73E+5	ID	ID
Chlorpyrifos	2921882	22	63	**2.0 (M); 0.002**	2.9	6.6	1,100 (S)	1,120	ID	ID
Chromium (III) (B,H)	16065831	100 (A)	100 (A)	(G,X)	NLV	NLV	2.9E+8	NA	ID	ID
Chromium (VI)	18540299	100 (A)	100 (A)	**11**	NLV	NLV	4.6E+5	NA	ID	ID
Chrysene (Q)	218019	1.6 (S)	1.6 (S)	ID	ID	ID	1.6 (S,AA)	1.6	ID	ID
Cobalt	7440484	**40**	100	100	NLV	NLV	2.4E+6	NA	ID	ID
Copper (B)	7440508	1,000 (E)	1,000 (E)	(G)	NLV	NLV	7.4E+6	NA	ID	ID
Cyanazine	21725462	**2.3**	9.4	56 (X)	NLV	NLV	2,800	1.70E+5	ID	ID

Attachment 1

TABLE 1. GROUNDWATER: RESIDENTIAL AND NONRESIDENTIAL PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS; PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs) DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per liter (ug/L). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic groundwater criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based or solubility value, whichever is lower (R299.5708). Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

Guidesheet Number ⟶		#1	#2	#3	#4	#5	#6	#7	#8	#9
Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria & RBSLs	Nonresidential Drinking Water Criteria & RBSLs	Groundwater Surface Water Interface Criteria & RBSLs	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Groundwater Contact Criteria & RBSLs	Water Solubility	Flammability and Explosivity Screening Level	Acute Inhalation Screening Level
Cyanide (P,R)	57125	200 (A)	200 (A)	5.2	NLV	NLV	57,000	NA	ID	ID
Cyclohexanone	108941	33,000	94,000	NA	1,500	3,300	2.3E+7 (S)	2.30E+7	NA	ID
Dacthal	1861321	73	210	NA	NLV	NLV	500 (S)	500	ID	ID
Dalapon	75990	200 (A)	200 (A)	NA	NLV	NLV	1.2E+7	5.02E+8	ID	ID
4-4'-DDD	72548	9.1	37	NA	NLV	NLV	44 (AA)	90	ID	ID
4-4'-DDE	72559	4.3	15	NA	NLV	NLV	27 (AA)	120	ID	ID
4-4'-DDT	50293	3.6	10	0.02 (M); 1.1E-5	NLV	NLV	13 (AA)	25	NA	ID
Decabromodiphenyl ether	1163195	30 (S)	30 (S)	NA	30 (S)	30 (S)	30 (S)	30	ID	ID
Di-n-butyl phthalate	84742	880	2,500	9.7	NLV	NLV	11,000 (S)	11,200	NA	ID
Di(2-ethylhexyl) adipate	103231	400 (A)	400 (A)	ID	NLV	NLV	470 (S)	471	ID	ID
Di-n-octyl phthalate	117840	130	380	ID	NLV	NLV	400	3,000	ID	ID
Diacetone alcohol (I)	123422	ID	ID	NA	NLV	NLV	ID	1.0E+9	1.0E+9 (S)	ID
Diazinon	333415	1.3	3.8	1.0 (M); 0.004	NLV	NLV	1,300	68,800	NA	ID
Dibenzo(a,h)anthracene (Q)	53703	2.0 (M); 0.21	2.0 (M); 0.85	ID	NLV	NLV	2.0 (M,AA); 0.31	2.49	ID	ID
Dibenzofuran	132649	ID	ID	4.0	10,000 (S)	10,000 (S)	ID	10,000	ID	ID
Dibromochloromethane	124481	80 (A,W)	80 (A,W)	ID	14,000	1.1E+5	18,000	2.60E+6	ID	ID
Dibromochloropropane	96128	0.2 (A)	0.2 (A)	ID	1,200 (S)	1,200 (S)	390	1,230	NA	ID
Dibromomethane	74953	80	230	NA	ID	ID	5.3E+5	1.10E+7	ID	ID
Dicamba	1918009	220	630	NA	NLV	NLV	5.9E+5	4.5E+6	ID	ID
1,2-Dichlorobenzene	95501	600 (A)	600 (A)	13	1.6E+5 (S)	1.6E+5 (S)	1.6E+5 (S)	1.56E+5	NA	1.6E+5 (S)
1,3-Dichlorobenzene	541731	6.6	19	28	18,000	41,000	2,000	1.11E+5	ID	ID

Attachment 1

TABLE 1. GROUNDWATER: RESIDENTIAL AND NONRESIDENTIAL PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS; PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs) DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per liter (ug/L). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic groundwater criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based or solubility value, whichever is lower (R299.5708). Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

Guidesheet Number ⟶		#1	#2	#3	#4	#5	#6	#7	#8	#9
Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria & RBSLs	Nonresidential Drinking Water Criteria & RBSLs	Groundwater Surface Water Interface Criteria & RBSLs	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Groundwater Contact Criteria & RBSLs	Water Solubility	Flammability and Explosivity Screening Level	Acute Inhalation Screening Level
1,4-Dichlorobenzene	106467	75 (A)	75 (A)	17	16,000	74,000 (S)	6,400	73,800	NA	ID
3,3'-Dichlorobenzidine	91941	1.1	4.3	0.3 (M); 0.2	NLV	NLV	180	3,110	ID	ID
Dichlorodifluoromethane	75718	1,700	4,800	ID	2.2E+5	3.0E+5 (S)	3.0E+5 (S)	3.00E+5	ID	ID
1,1-Dichloroethane	75343	880	2,500	740	1.0E+6	2.3E+6	2.4E+6	5.06E+6	3.8E+5	ID
1,2-Dichloroethane (I)	107062	5.0 (A)	5.0 (A)	360 (X)	9,600	59,000	19,000	8.52E+6	2.5E+6	ID
1,1-Dichloroethylene (I)	75354	7.0 (A)	7.0 (A)	130	200	1,300	11,000	2.25E+6	97,000	1.4E+5
cis-1,2-Dichloroethylene	156592	70 (A)	70 (A)	620	93,000	2.1E+5	2.0E+5	3.50E+6	5.3E+5	ID
trans-1,2-Dichloroethylene	156605	100 (A)	100 (A)	1,500 (X)	85,000	2.0E+5	2.2E+5	6.30E+6	2.3E+5	ID
2,6-Dichloro-4-nitroaniline	99309	2,200	6,300	NA	NLV	NLV	7,000 (S)	7,000	ID	ID
2,4-Dichlorophenol	120832	73	210	11	NLV	NLV	48,000	4.50E+6	ID	ID
2,4-Dichlorophenoxyacetic acid	94757	70 (A)	70 (A)	220	NLV	NLV	1.2E+5	6.80E+5	ID	ID
1,2-Dichloropropane (I)	78875	5.0 (A)	5.0 (A)	230 (X)	16,000	36,000	16,000	2.80E+6	5.5E+5	2.8E+6 (S)
1,3-Dichloropropene	542756	8.5	35	9.0 (X)	3,900	26,000	5,500	2.80E+6	1.3E+5	ID
Dichlorovos	62737	1.6	6.7	NA	NLV	NLV	5,900	1.60E+7	NA	ID
Dicyclohexyl phthalate	84617	ID	ID	NA	ID	ID	ID	4,000	ID	ID
Dieldrin	60571	0.11	0.43	0.02 (M); 6.5E-6	200 (S)	200 (S)	2.4 (AA)	195	ID	ID
Diethyl ether	60297	10 (E)	10 (E)	ID	6.1E+7 (S)	6.1E+7 (S)	3.5E+7	6.10E+7	6.5E+5	6.1E+7 (S)
Diethyl phthalate	84662	5,500	16,000	110	NLV	NLV	1.1E+6 (S)	1.08E+6	NA	ID
Diethylene glycol monobutyl ether	112345	88	250	NA	NLV	NLV	4.0E+6	1.0E+9	ID	ID
Diisopropyl ether	108203	30	86	ID	8,000 (S)	8,000 (S)	8,000 (S)	8,041	8,000 (S)	ID
Diisopropylamine (I)	108189	5.6	16	NA	2.1E+7	3.7E+7 (S)	21,000	3.69E+7	4.6E+6	ID

Attachment 1

TABLE 1. GROUNDWATER: RESIDENTIAL AND NONRESIDENTIAL PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS; PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs) DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per liter (ug/L). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic groundwater criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based or solubility value, whichever is lower (R299.5708). Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

Guidesheet Number ⟶		#1	#2	#3	#4	#5	#6	#7	#8	#9
Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria & RBSLs	Nonresidential Drinking Water Criteria & RBSLs	Groundwater Surface Water Interface Criteria & RBSLs	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Groundwater Contact Criteria & RBSLs	Water Solubility	Flammability and Explosivity Screening Level	Acute Inhalation Screening Level
Dimethyl phthalate	131113	73,000	2.1E+5	NA	NLV	NLV	4.2E+6 (S)	4.19E+6	NA	ID
N,N-Dimethylacetamide	127195	180	520	4,100 (X)	NLV	NLV	2.3E+7	1.0E+9	NA	ID
N,N-Dimethylaniline	121697	16	46	NA	2.4E+5	1.3E+6 (S)	20,000	1.27E+6	NA	1.3E+6 (S)
Dimethylformamide (I)	68122	700	2,000	NA	NLV	NLV	1.1E+8	1.0E+9	ID	ID
2,4-Dimethylphenol	105679	370	1,000	380	NLV	NLV	5.2E+5	7.87E+6	ID	ID
2,6-Dimethylphenol	576261	4.4	13	NA	NLV	NLV	6,300	6.14E+6	ID	ID
3,4-Dimethylphenol	95658	10	29	NA	NLV	NLV	18,000	4.93E+6	ID	ID
Dimethylsulfoxide	67685	2.2E+5	6.3E+5	1.9E+5	NLV	NLV	1.7E+8 (S)	1.66E+8	ID	ID
2,4-Dinitrotoluene	121142	7.7	32	NA	NLV	NLV	8,600	2.70E+5	ID	ID
Dinoseb	88857	7.0 (A)	7.0 (A)	1.0 (M); 0.48	NLV	NLV	7,000	52,000	ID	ID
1,4-Dioxane (I)	123911	85	350	2,800 (X)	NLV	NLV	1.7E+6	9.00E+8	1.4E+8	ID
Diquat	85007	20 (A)	20 (A)	NA	NLV	NLV	7.0E+5 (S)	7.00E+5	ID	ID
Dissolved oxygen (DO)	NA	ID	ID	(EE)	ID	ID	ID	NA	NA	NA
Diuron	330541	31	90	NA	NLV	NLV	37,000 (S)	37,300	ID	ID
Endosulfan (J)	115297	44	130	0.03 (M); 0.029	ID	ID	510 (S)	510	ID	ID
Endothall	145733	100 (A)	100 (A)	NA	NLV	NLV	2.5E+7 (AA)	1.00E+8	ID	ID
Endrin	72208	2.0 (A)	2.0 (A)	ID	NLV	NLV	160 (AA)	250	ID	ID
Epichlorohydrin (I)	106898	5.0 (M); 2.0 (A)	5.0 (M); 2.0 (A)	NA	3.2E+5	6.3E+5	11,000	6.60E+7	4.7E+7	ID
Ethanol (I)	64175	1.9E+6	3.8E+6	ID	NLV	NLV	1.0E+9 (D,S)	1.0E+9	9.7E+7	ID
Ethyl acetate (I)	141786	6,600	19,000	NA	6.4E+7 (S)	6.4E+7 (S)	6.4E+7 (S)	6.40E+7	4.2E+6	ID
Ethyl-tert-butyl ether (ETBE)	637923	49 (E)	49 (E)	ID	2.9E+6	5.6E+6 (S)	ID	5.63E+6	ID	ID

Attachment 1
TABLE 1. GROUNDWATER: RESIDENTIAL AND NONRESIDENTIAL PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS; PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per liter (ug/L). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic groundwater criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based or solubility value, whichever is lower (R299.5708). Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

Guidesheet Number ⟶		#1	#2	#3	#4	#5	#6	#7	#8	#9
Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria & RBSLs	Nonresidential Drinking Water Criteria & RBSLs	Groundwater Surface Water Interface Criteria & RBSLs	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Groundwater Contact Criteria & RBSLs	Water Solubility	Flammability and Explosivity Screening Level	Acute Inhalation Screening Level
Ethylbenzene (I)	100414	74 (E)	74 (E)	18	1.1E+5	1.7E+5 (S)	1.7E+5 (S)	1.69E+5	43,000	1.7E+5 (S)
Ethylene dibromide	106934	0.05 (A)	0.05 (A)	5.7 (X)	2,400	15,000	25	4.20E+6	ID	ID
Ethylene glycol	107211	15,000	42,000	1.9E+5 (X)	NLV	NLV	1.0E+9 (D,S)	1.0E+9	NA	1.0E+9 (D,S)
Ethylene glycol monobutyl ether	111762	3,700	10,000	NA	2.9E+6	6.5E+6	5.3E+7	2.24E+8	NA	ID
Fluoranthene	206440	210 (S)	210 (S)	1.6	210 (S)	210 (S)	210 (S)	206	ID	ID
Fluorene	86737	880	2,000 (S)	12	2,000 (S)	2,000 (S)	2,000 (S)	1,980	ID	ID
Fluorine (soluble fluoride) (B)	7782414	2,000 (E)	2,000 (E)	ID	NLV	NLV	1.2E+7	NA	ID	ID
Formaldehyde	50000	1,300	3,800	120	63,000	3.6E+5	3.0E+7	5.50E+8	ID	61,000
Formic acid (I,U)	64186	10,000	29,000	ID	7.7E+6	1.5E+7	6.0E+8	1.0E+9	1.0E+9 (D)	3.5E+8
1-Formylpiperidine	2591868	80	230	NA	ID	ID	ID	NA	ID	ID
Gentian violet	548629	15	63	NA	NLV	NLV	1.0E+6 (S)	1.00E+6	ID	ID
Glyphosate	1071836	700 (A)	700 (A)	NA	NLV	NLV	1.2E+7 (S,AA)	1.16E+7	ID	ID
Heptachlor	76448	0.4 (A)	0.4 (A)	0.01 (M); 0.0018	180 (S)	180 (S)	2.9 (AA)	180	ID	ID
Heptachlor epoxide	1024573	0.2 (A)	0.2 (A)	ID	NLV	NLV	9.0 (AA)	200	ID	ID
n-Heptane	142825	2,700 (S)	2,700 (S)	NA	2,700 (S)	2,700 (S)	2,700 (S)	2,690	200	2,700 (S)
Hexabromobenzene	87821	0.17 (S); 20	0.17 (S); 58	ID	ID	ID	0.17 (S); 1,500	0.17	ID	ID
Hexachlorobenzene (C-66)	118741	1.0 (A)	1.0 (A)	0.2 (M); 0.0003	440	3,000	4.6	6,200	ID	ID
Hexachlorobutadiene (C-46)	87683	15	42	0.053	1,600	3,200 (S)	400	3,230	ID	ID
alpha-Hexachlorocyclohexane	319846	0.43	1.7	ID	2,000 (S)	2,000 (S)	60	2,000	ID	ID
beta-Hexachlorocyclohexane	319857	0.88	3.6	ID	NLV	NLV	120	240	ID	ID
Hexachlorocyclopentadiene (C-56)	77474	50 (A)	50 (A)	ID	130	420	1,600	1,800	ID	ID

Attachment 1
TABLE 1. GROUNDWATER: RESIDENTIAL AND NONRESIDENTIAL PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS; PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per liter (ug/L). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic groundwater criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based or solubility value, whichever is lower (R299.5708). Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

Guidesheet Number →		#1	#2	#3	#4	#5	#6	#7	#8	#9
Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria & RBSLs	Nonresidential Drinking Water Criteria & RBSLs	Groundwater Surface Water Interface Criteria & RBSLs	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Groundwater Contact Criteria & RBSLs	Water Solubility	Flammability and Explosivity Screening Level	Acute Inhalation Screening Level
Hexachloroethane	67721	7.3	21	6.7 (X)	27,000	50,000 (S)	1,900	50,000	ID	ID
n-Hexane	110543	3,000	8,600	NA	12,000 (S)	12,000 (S)	12,000 (S)	12,000	12,000 (S)	ID
2-Hexanone	591786	1,000	2,900	ID	4.2E+6	8.7E+6	5.2E+6	1.60E+7	NA	ID
Indeno(1,2,3-cd)pyrene (Q)	193395	2.0 (M); 0.022 (S)	2.0 (M); 0.022 (S)	ID	NLV	NLV	2.0 (M,AA); 0.022 (S)	0.022	ID	ID
Iron (B)	7439896	300 (E)	300 (E)	NA	NLV	NLV	5.8E+7	NA	ID	ID
Isobutyl alcohol (I)	78831	2,300	6,700	NA	7.6E+7 (S)	7.6E+7 (S)	2.5E+7	7.60E+7	ID	ID
Isophorone	78591	770	3,100	1,300 (X)	NLV	NLV	9.9E+5	1.20E+7	ID	1.2E+7 (S)
Isopropyl alcohol (I)	67630	470	1,300	57,000 (X)	NLV	NLV	1.3E+7	1.0E+9	6.0E+7	1.0E+9 (D,S)
Isopropyl benzene	98828	800	2,300	28	56,000 (S)	56,000 (S)	56,000 (S)	56,000	29,000	ID
Lead (B)	7439921	4.0 (L)	4.0 (L)	(G,X)	NLV	NLV	ID	NA	ID	ID
Lindane	58899	0.2 (A)	0.2 (A)	0.03 (M); 0.026	ID	ID	190	6,800	ID	ID
Lithium (B)	7439932	170	350	440	NLV	NLV	5.4E+6	NA	ID	ID
Magnesium (B)	7439954	4.0E+5	1.1E+6	NA	NLV	NLV	1.0E+9 (D)	NA	ID	ID
Manganese (B)	7439965	50 (E)	50 (E)	(G,X)	NLV	NLV	9.1E+6	NA	ID	ID
Mercury (Total) (B,Z)	Varies	2.0 (A)	2.0 (A)	0.0013	56 (S)	56 (S)	56 (S)	56	ID	ID
Methane	74828	ID	ID	NA	(K)	(K)	ID	NA	520	ID
Methanol	67561	3,700	10,000	5.9E+5 (X)	2.9E+7 (S)	2.9E+7 (S)	2.9E+7 (S)	2.90E+7	4.5E+6	2.9E+7 (S)
Methoxychlor	72435	40 (A)	40 (A)	NA	ID	ID	45 (S)	45	ID	ID
2-Methoxyethanol (I)	109864	7.3	21	NA	NLV	NLV	8.3E+5	1.0E+9	ID	ID
2-Methyl-4-chlorophenoxyacetic acid	94746	7.3	21	NA	NLV	NLV	9,200	9.24E+5	ID	ID
2-Methyl-4,6-dinitrophenol	534521	20 (M); 2.6	20 (M); 7.3	NA	NLV	NLV	9,500	2.00E+5	ID	ID

Attachment 1
TABLE 1. GROUNDWATER: RESIDENTIAL AND NONRESIDENTIAL PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS; PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per liter (ug/L). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic groundwater criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based or solubility value, whichever is lower (R299.5708). Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

Guidesheet Number ⟶		#1	#2	#3	#4	#5	#6	#7	#8	#9
Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria & RBSLs	Nonresidential Drinking Water Criteria & RBSLs	Groundwater Surface Water Interface Criteria & RBSLs	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Groundwater Contact Criteria & RBSLs	Water Solubility	Flammability and Explosivity Screening Level	Acute Inhalation Screening Level
N-Methyl-morpholine (I)	109024	20	56	NA	NLV	NLV	1.5E+6	1.0E+9	ID	ID
Methyl parathion	298000	1.8	5.2	NA	NLV	NLV	3,000	50,000	ID	ID
4-Methyl-2-pentanone (MIBK) (I)	108101	1,800	5,200	ID	2.0E+7 (S)	2.0E+7 (S)	1.3E+7	2.00E+7	ID	2.0E+7 (S)
Methyl-tert-butyl ether (MTBE)	1634044	40 (E)	40 (E)	7,100 (X)	4.7E+7 (S)	4.7E+7 (S)	6.1E+5	4.68E+7	ID	ID
Methylcyclopentane (I)	96377	ID	ID	NA	22,000	49,000	ID	73,890	ID	ID
4,4'-Methylene-bis-2-chloroaniline (MBOCA)	101144	1.1	4.5	NA	NLV	NLV	110 (AA)	14,000	ID	ID
Methylene chloride	75092	5.0 (A)	5.0 (A)	1,500 (X)	2.2E+5	1.4E+6	2.2E+5	1.70E+7	ID	ID
2-Methylnaphthalene	91576	260	750	19	25,000 (S)	25,000 (S)	25,000 (S)	24,600	ID	ID
Methylphenols (J)	1319773	370	1,000	30 (M); 25	NLV	NLV	8.1E+5	2.80E+7	NA	ID
Metolachlor	51218452	240	990	15	NLV	NLV	91,000	5.30E+5	ID	ID
Metribuzin	21087649	180	520	NA	ID	ID	1.2E+6 (S)	1.2E+6	ID	ID
Mirex	2385855	0.02 (M); 6.8E-6 (S)	0.02 (M); 6.8E-6 (S)	.02 (M); 6.8E-6 (S	ID	ID	0.02 (M); 6.8E-6 (S)	6.8E-6	NA	ID
Molybdenum (B)	7439987	73	210	3,200 (X)	NLV	NLV	9.7E+5	NA	ID	ID
Naphthalene	91203	520	1,500	11	31,000 (S)	31,000 (S)	31,000 (S)	31,000	NA	31,000 (S)
Nickel (B)	7440020	100 (A)	100 (A)	(G)	NLV	NLV	7.4E+7	NA	ID	ID
Nitrate (B,N)	14797558	10,000 (A,N)	10,000 (A,N)	ID	NLV	NLV	3.1E+8	NA	ID	ID
Nitrite (B,N)	14797650	1,000 (A,N)	1,000 (A,N)	NA	NLV	NLV	ID	NA	ID	ID
Nitrobenzene (I)	98953	3.4	9.6	180 (X)	2.8E+5	5.5E+5	11,000	2.09E+6	NA	ID
2-Nitrophenol	88755	20	58	ID	NLV	NLV	79,000	2.50E+6	ID	ID
n-Nitroso-di-n-propylamine	621647	5.0 (M); 0.19	5.0 (M); 0.77	NA	NLV	NLV	360	9.89E+6	ID	ID

Attachment 1

TABLE 1. GROUNDWATER: RESIDENTIAL AND NONRESIDENTIAL PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS; PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs) DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per liter (ug/L). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic groundwater criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based or solubility value, whichever is lower (R299.5708). Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

Guidesheet Number ⟶		#1	#2	#3	#4	#5	#6	#7	#8	#9
Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria & RBSLs	Nonresidential Drinking Water Criteria & RBSLs	Groundwater Surface Water Interface Criteria & RBSLs	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Groundwater Contact Criteria & RBSLs	Water Solubility	Flammability and Explosivity Screening Level	Acute Inhalation Screening Level
N-Nitrosodiphenylamine	86306	270	1,100	NA	NLV	NLV	35,000 (S)	35,100	ID	ID
Oxamyl	23135220	200 (A)	200 (A)	NA	NLV	NLV	6.2E+7	2.80E+8	ID	ID
Oxo-hexyl acetate	88230357	73	210	NA	ID	ID	ID	NA	ID	ID
Pendimethalin	40487421	280 (S)	280 (S)	NA	NLV	NLV	280 (S)	275	ID	ID
Pentachlorobenzene	608935	6.1	17	5.0 (M); 0.019	ID	ID	240	650	ID	ID
Pentachloronitrobenzene	82688	32 (S)	32 (S)	NA	32 (S)	32 (S)	32 (S)	32	ID	ID
Pentachlorophenol	87865	1.0 (A)	1.0 (A)	(G,X)	NLV	NLV	200	1.85E+6	ID	ID
Pentane	109660	ID	ID	NA	38,000 (S)	38,000 (S)	ID	38,200	340	38,000 (S)
2-Pentene (I)	109682	ID	ID	NA	ID	ID	ID	2.03E+5	ID	ID
pH	NA	6.5 to 8.5 (E)	6.5 to 8.5 (E)	6.5 to 9.0	ID	ID	ID	NA	NA	NA
Phenanthrene	85018	52	150	2.0 (M); 1.4	1,000 (S)	1,000 (S)	1,000 (S)	1,000	ID	ID
Phenol	108952	4,400	13,000	450	NLV	NLV	2.9E+7	8.28E+7	NA	ID
Phosphorus (Total)	7723140	63,000	2.4E+5	(EE)	NLV	NLV	ID	NA	ID	ID
Phthalic acid	88993	14,000	40,000	NA	NLV	NLV	1.4E+7 (S)	1.42E+7	ID	ID
Phthalic anhydride	85449	15,000	44,000	NA	NLV	NLV	6.2E+6 (S)	6.2E+6	NA	ID
Picloram	1918021	500 (A)	500 (A)	46	NLV	NLV	4.3E+5 (S)	4.30E+5	ID	ID
Piperidine	110894	3.2	9.2	NA	NLV	NLV	34,000	1.0E+9	ID	ID
Polybrominated biphenyls (J)	67774327	0.03	0.09	ID	NLV	NLV	ID	1.66E+7	ID	ID
Polychlorinated biphenyls (PCBs) (J,T)	1336363	0.5 (A)	0.5 (A)	0.2 (M); 2.6E-5	45 (S)	45 (S)	3.3 (AA)	44.7	ID	ID
Prometon	1610180	160	460	NA	NLV	NLV	1.8E+5	7.50E+5	ID	ID
Propachlor	1918167	95	270	NA	NLV	NLV	4.4E+5	6.55E+5	ID	ID

Attachment 1
TABLE 1. GROUNDWATER: RESIDENTIAL AND NONRESIDENTIAL PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS; PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per liter (ug/L). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic groundwater criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based or solubility value, whichever is lower (R299.5708). Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

Guidesheet Number ⟶		#1	#2	#3	#4	#5	#6	#7	#8	#9
Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria & RBSLs	Nonresidential Drinking Water Criteria & RBSLs	Groundwater Surface Water Interface Criteria & RBSLs	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Groundwater Contact Criteria & RBSLs	Water Solubility	Flammability and Explosivity Screening Level	Acute Inhalation Screening Level
Propazine	139402	200	560	NA	NLV	NLV	8,600 (S)	8,600	ID	ID
Propionic acid	79094	12,000	35,000	ID	NLV	NLV	2.8E+8	1.0E+9	1.0E+9 (D)	ID
Propyl alcohol (I)	71238	1,400	4,000	NA	NLV	NLV	2.8E+7	1.0E+9	7.1E+7	1.0E+9 (D,S)
n-Propylbenzene (I)	103651	80	230	ID	ID	ID	15,000	NA	ID	ID
Propylene glycol	57556	1.5E+5	4.2E+5	2.9E+5	NLV	NLV	1.0E+9 (D,S)	1.0E+9	ID	ID
Pyrene	129000	140 (S)	140 (S)	ID	140 (S)	140 (S)	140 (S)	135	ID	ID
Pyridine (I)	110861	20 (M); 7.3	21	NA	5,500	12,000	94,000	3.00E+5	81,000	ID
Selenium (B)	7782492	50 (A)	50 (A)	5.0	NLV	NLV	9.7E+5	NA	ID	ID
Silver (B)	7440224	34	98	0.2 (M); 0.06	NLV	NLV	1.5E+6	NA	ID	ID
Silvex (2,4,5-TP)	93721	50 (A)	50 (A)	30	NLV	NLV	43,000	1.40E+5	ID	ID
Simazine	122349	4.0 (A)	4.0 (A)	17	NLV	NLV	4,500 (S)	4,470	ID	ID
Sodium	17341252	1.2E+5	3.5E+5	NA	NLV	NLV	1.0E+9 (D)	NA	ID	ID
Sodium azide	26628228	88	250	50 (M); 7.3	ID	ID	ID	NA	ID	ID
Strontium (B)	7440246	4,600	13,000	21,000	NLV	NLV	1.2E+8	NA	ID	ID
Styrene	100425	100 (A)	100 (A)	80 (X)	1.7E+5	3.1E+5 (S)	9,700	3.10E+5	1.4E+5	3.1E+5 (S)
Sulfate	14808798	2.5E+5 (E)	2.5E+5 (E)	NA	NLV	NLV	ID	NA	ID	ID
Tebuthiuron	34014181	510	1,500	NA	NLV	NLV	2.5E+6 (S)	2.50E+6	ID	ID
2,3,7,8-Tetrabromodibenzo-p-dic (O)	50585416	(O)	(O)	(O)	NLV	NLV	(O)	0.00996	ID	ID
1,2,4,5-Tetrachlorobenzene	95943	1,300 (S)	1,300 (S)	2.9 (X)	1,300 (S)	1,300 (S)	1,300 (S)	1,300	ID	ID
2,3,7,8-Tetrachlorodibenzo-p-dic (O)	1746016	3.0E-5 (A)	3.0E-5 (A)	1.0E-5 (M); 3.1E-9	NLV	NLV	1.0E-5 (M,O,AA)	0.019	ID	ID
1,1,1,2-Tetrachloroethane	630206	77	320	ID	15,000	96,000	30,000	1.10E+6	ID	ID

Attachment 1
TABLE 1. GROUNDWATER: RESIDENTIAL AND NONRESIDENTIAL PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS; PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per liter (ug/L). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic groundwater criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based or solubility value, whichever is lower (R299.5708). Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

Guidesheet Number ⟶		#1	#2	#3	#4	#5	#6	#7	#8	#9
Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria & RBSLs	Nonresidential Drinking Water Criteria & RBSLs	Groundwater Surface Water Interface Criteria & RBSLs	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Groundwater Contact Criteria & RBSLs	Water Solubility	Flammability and Explosivity Screening Level	Acute Inhalation Screening Level
1,1,2,2-Tetrachloroethane	79345	8.5	35	78 (X)	12,000	77,000	4,700	2.97E+6	ID	ID
Tetrachloroethylene	127184	5.0 (A)	5.0 (A)	60 (X)	25,000	1.7E+5	12,000	2.0E+5	ID	2.0E+5 (S)
Tetrahydrofuran	109999	95	270	11,000 (X)	6.9E+6	1.6E+7	1.6E+6	1.0E+9	60,000	3.6E+6
Tetranitromethane	509148	ID	ID	NA	580	3,200	ID	85,000	ID	ID
Thallium (B)	7440280	2.0 (A)	2.0 (A)	3.7 (X)	NLV	NLV	13,000	NA	ID	ID
Toluene (I)	108883	790 (E)	790 (E)	270	5.3E+5 (S)	5.3E+5 (S)	5.3E+5 (S)	5.26E+5	61,000	ID
p-Toluidine	106490	15	62	NA	NLV	NLV	24,000	7.60E+6	NA	ID
Total dissolved solids (TDS)	NA	5.0E+5 (E)	5.0E+5 (E)	(EE)	ID	ID	ID	NA	NA	NA
Toxaphene	8001352	3.0 (A)	3.0 (A)	1.0 (M); 6.8E-5	NLV	NLV	44	740	ID	740 (S)
Triallate	2303175	95	270	NA	ID	ID	4,000 (S)	4,000	ID	ID
Tributylamine	102829	10	29	ID	14,000	32,000	2,300	75,400	ID	ID
1,2,4-Trichlorobenzene	120821	70 (A)	70 (A)	99 (X)	3.0E+5 (S)	3.0E+5 (S)	19,000	3.00E+5	NA	3.0E+5 (S)
1,1,1-Trichloroethane	71556	200 (A)	200 (A)	89	6.6E+5	1.3E+6 (S)	1.3E+6 (S)	1.33E+6	ID	1.3E+6 (S)
1,1,2-Trichloroethane	79005	5.0 (A)	5.0 (A)	330 (X)	17,000	1.1E+5	21,000	4.42E+6	NA	ID
Trichloroethylene	79016	5.0 (A)	5.0 (A)	200 (X)	15,000	97,000	22,000	1.10E+6	ID	1.1E+6 (S)
Trichlorofluoromethane	75694	2,600	7,300	NA	1.1E+6 (S)	1.1E+6 (S)	1.1E+6 (S)	1.10E+6	ID	1.1E+6 (S)
2,4,5-Trichlorophenol	95954	730	2,100	NA	NLV	NLV	1.7E+5	1.20E+6	ID	ID
2,4,6-Trichlorophenol	88062	120	470	5.0	NLV	NLV	10,000	8.00E+5	ID	ID
1,2,3-Trichloropropane	96184	42	120	NA	8,300	18,000	84,000	1.90E+6	NA	ID
1,1,2-Trichloro-1,2,2-trifluoroetha	76131	1.7E+5 (S)	1.7E+5 (S)	32	1.7E+5 (S)	1.7E+5 (S)	1.7E+5 (S)	1.70E+5	ID	1.7E+5 (S)
Triethanolamine	102716	3,700	10,000	NA	NLV	NLV	1.0E+9 (D,S)	1.0E+9	ID	ID

Attachment 1

TABLE 1. GROUNDWATER: RESIDENTIAL AND NONRESIDENTIAL PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS; PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs) DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per liter (ug/L). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic groundwater criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based or solubility value, whichever is lower (R299.5708). Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

Guidesheet Number ⟶		#1	#2	#3	#4	#5	#6	#7	#8	#9
Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria & RBSLs	Nonresidential Drinking Water Criteria & RBSLs	Groundwater Surface Water Interface Criteria & RBSLs	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Groundwater Contact Criteria & RBSLs	Water Solubility	Flammability and Explosivity Screening Level	Acute Inhalation Screening Level
Triethylene glycol	112276	4,300	12,000	NA	NLV	NLV	1.0E+6 (S)	1.00E+6	ID	ID
3-Trifluoromethyl-4-nitrophenol	88302	4,500	13,000	NA	NLV	NLV	5.0E+6 (S)	5.00E+6	ID	ID
Trifluralin	1582098	37	110	NA	ID	ID	2,400	8,100	ID	ID
2,2,4-Trimethyl pentane	540841	ID	ID	NA	2,300 (S)	2,300 (S)	ID	2,330	160	ID
2,4,4-Trimethyl-2-pentene (I)	107404	ID	ID	NA	ID	ID	ID	11,900	ID	ID
1,2,4-Trimethylbenzene (I)	95636	63 (E)	63 (E)	17	56,000 (S)	56,000 (S)	56,000 (S)	55,890	56,000 (S)	ID
1,3,5-Trimethylbenzene (I)	108678	72 (E)	72 (E)	45	61,000 (S)	61,000 (S)	61,000 (S)	61,150	ID	ID
Triphenyl phosphate	115866	1,200	1,400 (S)	NA	NLV	NLV	1,400 (S)	1,430	ID	ID
tris(2,3-Dibromopropyl)phosphat	126727	10 (M); 0.71	10 (M); 2.9	ID	4,700 (S)	4,700 (S)	2,100	4,700	ID	ID
Urea	57136	ID	ID	NA	NLV	NLV	ID	NA	ID	ID
Vanadium	7440622	4.5	62	12	NLV	NLV	9.7E+5	NA	ID	ID
Vinyl acetate (I)	108054	640	1,800	NA	4.1E+6	8.9E+6	8.0E+6	2.00E+7	1.8E+6	4.8E+6
Vinyl chloride	75014	2.0 (A)	2.0 (A)	13 (X)	1,100	13,000	1,000	2.76E+6	33,000	ID
White phosphorus (R)	12185103	0.11	0.31	NA	NLV	NLV	2,900	NA	ID	ID
Xylenes (I)	1330207	280 (E)	280 (E)	41	1.9E+5 (S)	1.9E+5 (S)	1.9E+5 (S)	1.86E+5	70,000	1.9E+5 (S)
Zinc (B)	7440666	2,400	5,000 (E)	(G)	NLV	NLV	1.1E+8	NA	ID	ID

Attachment 1
TABLE 2. SOIL: RESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per kilogram (ug/kg). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic soil criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value. Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

			Groundwater Protection			Indoor Air	Ambient Air (Y)				Direct Contact	
Guidesheet Number →		#10	#11	#12	#13	#14	#15	#16	#17	#18	#19	#20
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
Acenaphthene	83329	NA	3.0E+5	**8,700**	9.7E+5	1.9E+8	8.1E+7	8.1E+7	8.1E+7	1.4E+10	4.1E+7	NA
Acenaphthylene	208968	NA	5,900	ID	4.4E+5	1.6E+6	2.2E+6	2.2E+6	2.2E+6	2.3E+9	1.6E+6	NA
Acetaldehyde (I)	75070	NA	19,000	**2,600**	1.1E+8 (C)	2.2E+5	1.7E+5	1.7E+5	2.8E+5	6.0E+8	2.9E+7	1.1E+8
Acetate	71501	NA	ID	(G)	ID	ID	ID	ID	ID	ID	ID	ID
Acetic acid	64197	NA	84,000	(G)	6.5E+8 (C)	NLV	NLV	NLV	NLV	1.7E+10	1.3E+8	6.5E+8
Acetone (I)	67641	NA	**15,000**	34,000	1.1E+8 (C)	1.1E+8 (C)	1.3E+8	1.3E+8	1.9E+8	3.9E+11	2.3E+7	1.1E+8
Acetonitrile	75058	NA	2,800	NA	2.2E+7 (C)	4.8E+6	1.6E+6	1.6E+6	2.1E+6	4.0E+9	4.3E+6	2.2E+7
Acetophenone	98862	NA	30,000	ID	1.1E+6 (C)	1.1E+6 (C)	4.4E+7	4.4E+7	4.4E+7	3.3E+10	1.1E+6 (C)	1.1E+6
Acrolein (I)	107028	NA	2,400	NA	2.3E+7 (C)	410	310	310	610	1.3E+6	3.6E+6	2.3E+7
Acrylamide	79061	NA	10	200 (X)	2.6E+5	NLV	NLV	NLV	NLV	2.4E+6	1,900	NA
Acrylic acid	79107	NA	78,000	NA	1.1E+8 (C)	2.4E+6	1.9E+5	2.3E+5	2.3E+5	6.7E+7	3.5E+7 (DD)	1.1E+8
Acrylonitrile (I)	107131	NA	**100 (M); 52**	100 (M); 40	2.8E+5	6,600	5,000	5,100	10,000	4.6E+7	16,000	8.3E+6
Alachlor	15972608	NA	**52**	290 (X)	44,000	NLV	NLV	NLV	NLV	ID	93,000	NA
Aldicarb	116063	NA	60	NA	2.4E+6	NLV	NLV	NLV	NLV	ID	2.3E+5	NA
Aldicarb sulfone	1646884	NA	200 (M); 40	NA	4.2E+7	NLV	NLV	NLV	NLV	ID	2.5E+5	NA
Aldicarb sulfoxide	1646873	NA	200(M); 80	NA	5.4E+7	NLV	NLV	NLV	NLV	ID	2.9E+5	NA
Aldrin	309002	NA	NLL	NLL	NLL	1.3E+6	58,000	58,000	58,000	6.4E+5	**1,000**	NA
Aluminum (B)	7429905	6.9E+6	1,000	NA	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	5.0E+7 (DD)	NA
Ammonia	7664417	NA	ID	(CC)	ID	ID	ID	ID	ID	6.7E+9	ID	1.0E+7
t-Amyl methyl ether (TAME)	994058	NA	3,900	NA	4.4E+5 (C)	58,000	3.4E+5	7.6E+5	1.8E+6	4.1E+9	4.4E+5 (C)	4.4E+5
Aniline	62533	NA	1,100	**330 (M); 80**	2.8E+6	NLV	NLV	NLV	NLV	6.7E+7	3.3E+5	4.5E+6

Attachment 1
TABLE 2. SOIL: RESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per kilogram (ug/kg). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic soil criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value. Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

			Groundwater Protection			Indoor Air	Ambient Air (Y)				Direct Contact	
Guidesheet Number ⟶		#10	#11	#12	#13	#14	#15	#16	#17	#18	#19	#20
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
Anthracene	120127	NA	41,000	ID	41,000	1.0E+9 (D)	1.4E+9	1.4E+9	1.4E+9	6.7E+10	2.3E+8	NA
Antimony	7440360	NA	4,300	94,000 (X)	4.9E+7	NLV	NLV	NLV	NLV	1.3E+7	1.8E+5	NA
Arsenic	7440382	5,800	4,600	4,600	2.0E+6	NLV	NLV	NLV	NLV	7.2E+5	7,600	NA
Asbestos (BB)	1332214	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	1.0E+7 (M); 68,000	ID	NA
Atrazine	1912249	NA	60	150	1.1E+5	NLV	NLV	NLV	NLV	ID	71,000 (DD)	NA
Azobenzene	103333	NA	4,200	ID	3.0E+5	6.1E+6	6.3E+5	6.3E+5	6.3E+5	1.0E+8	1.4E+5	NA
Barium (B)	7440393	75,000	1.3E+6	(G)	1.0E+9 (D)	NLV	NLV	NLV	NLV	3.3E+8	3.7E+7	NA
Benzene (I)	71432	NA	100	4,000 (X)	2.2E+5	1,600	13,000	34,000	79,000	3.8E+8	1.8E+5	4.0E+5
Benzidine	92875	NA	1,000 (M); 6.0	1,000 (M); 6.0	1,000 (M); 140	NLV	NLV	NLV	NLV	46,000	1,000 (M); 23	NA
Benzo(a)anthracene (Q)	56553	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	20,000	NA
Benzo(b)fluoranthene (Q)	205992	NA	NLL	NLL	NLL	ID	ID	ID	ID	ID	20,000	NA
Benzo(k)fluoranthene (Q)	207089	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	2.0E+5	NA
Benzo(g,h,i)perylene	191242	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	8.0E+8	2.5E+6	NA
Benzo(a)pyrene (Q)	50328	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	1.5E+6	2,000	NA
Benzoic acid	65850	NA	6.4E+5	NA	7.0E+7	NLV	NLV	NLV	NLV	ID	9.9E+8	NA
Benzyl alcohol	100516	NA	2.0E+5	NA	5.8E+6 (C)	NLV	NLV	NLV	NLV	3.3E+11	5.8E+6 (C)	5.8E+6
Benzyl chloride	100447	NA	150	NA	72,000	6,300	14,000	14,000	17,000	6.2E+7	48,000	2.3E+5
Beryllium	7440417	NA	51,000	(G)	1.0E+9 (D)	NLV	NLV	NLV	NLV	1.3E+6	4.1E+5	NA
bis(2-Chloroethoxy)ethane	112265	NA	ID	ID	ID	NLV	NLV	NLV	NLV	ID	ID	2.7E+6
bis(2-Chloroethyl)ether (I)	111444	NA	100	100 (M); 20	1.1E+5	8,300	3,800	3,800	3,800	9.4E+6	13,000	2.2E+6
bis(2-Ethylhexyl)phthalate	117817	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	7.0E+8	2.8E+6	1.0E+7

Attachment 1
TABLE 2. SOIL: RESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per kilogram (ug/kg). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic soil criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value. Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

			Groundwater Protection			Indoor Air	Ambient Air (Y)				Direct Contact	
Guidesheet Number ⟶		#10	#11	#12	#13	#14	#15	#16	#17	#18	#19	#20
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
Boron (B)	7440428	NA	**10,000**	1.0E+5 (X)	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	4.8E+7 (DD)	NA
Bromate	15541454	NA	**200**	800 (X)	96,000	NLV	NLV	NLV	NLV	ID	17,000	NA
Bromobenzene (I)	108861	NA	550	NA	3.6E+5	3.1E+5	4.5E+5	4.5E+5	4.5E+5	5.3E+8	5.4E+5	7.6E+5
Bromodichloromethane	75274	NA	1,600 (W)	ID	2.8E+5	1,200	9,100	9,700	19,000	8.4E+7	1.1E+5	1.5E+6
Bromoform	75252	NA	1,600 (W)	ID	8.7E+5 (C)	1.5E+5	9.0E+5	9.0E+5	9.0E+5	2.8E+9	8.2E+5	8.7E+5
Bromomethane	74839	NA	**200**	700	1.4E+6	860	11,000	57,000	1.4E+5	3.3E+8	3.2E+5	2.2E+6
n-Butanol (I)	71363	NA	19,000	NA	8.7E+6 (C)	NLV	NLV	NLV	NLV	2.3E+10	8.7E+6 (C)	8.7E+6
2-Butanone (MEK) (I)	78933	NA	2.6E+5	**44,000**	2.7E+7 (C)	2.7E+7 (C)	2.9E+7	2.9E+7	3.5E+7	6.7E+10	2.7E+7 (C,DD)	2.7E+7
n-Butyl acetate	123864	NA	11,000	NA	1.1E+6 (C)	1.1E+6 (C)	1.1E+8	2.6E+8	3.2E+8	4.7E+11	1.1E+6 (C)	1.1E+6
t-Butyl alcohol	75650	NA	78,000	NA	1.1E+8 (C)	1.1E+8 (C)	9.7E+7	2.0E+8	2.0E+8	1.3E+11	1.1E+8 (C)	1.1E+8
Butyl benzyl phthalate	85687	NA	3.1E+5 (C)	**1.2E+5 (X)**	3.1E+5 (C)	NLV	NLV	NLV	NLV	4.7E+10	3.1E+5 (C)	3.1E+5
n-Butylbenzene	104518	NA	1,600	ID	1.2E+5	ID	ID	ID	ID	2.0E+9	2.5E+6	1.0E+7
sec-Butylbenzene	135988	NA	1,600	ID	88,000	ID	ID	ID	ID	4.0E+8	2.5E+6	1.0E+7
t-Butylbenzene (I)	98066	NA	1,600	ID	1.8E+5	ID	ID	ID	ID	6.7E+8	2.5E+6	1.0E+7
Cadmium (B)	7440439	1,200	6,000	(G,X)	2.3E+8	NLV	NLV	NLV	NLV	1.7E+6	5.5E+5	NA
Camphene (I)	79925	NA	ID	NA	ID	3,700	1.5E+5	9.1E+5	2.2E+6	5.3E+9	ID	NA
Caprolactam	105602	NA	1.2E+5	NA	1.0E+9 (D)	NLV	NLV	NLV	NLV	6.7E+8	5.3E+7 (DD)	NA
Carbaryl	63252	NA	14,000	NA	2.6E+6	ID	ID	ID	ID	ID	2.2E+7	NA
Carbazole	86748	NA	9,400	**1,100**	8.2E+5	NLV	NLV	NLV	NLV	6.2E+7	5.3E+5	NA
Carbofuran	1563662	NA	800	NA	6.8E+6	NLV	NLV	NLV	NLV	ID	1.1E+6	NA
Carbon disulfide (I,R)	75150	NA	16,000	ID	2.8E+5 (C)	76,000	1.3E+6	7.9E+6	1.9E+7	4.7E+10	2.8E+5 (C,DD)	2.8E+5

Attachment 1
TABLE 2. SOIL: RESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per kilogram (ug/kg). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic soil criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value. Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

			Groundwater Protection			Indoor Air	Ambient Air (Y)				Direct Contact	
Guidesheet Number →		#10	#11	#12	#13	#14	#15	#16	#17	#18	#19	#20
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
Carbon tetrachloride	56235	NA	100	900 (X)	92,000	190	3,500	12,000	28,000	1.3E+8	96,000	3.9E+5
Chlordane (J)	57749	NA	NLL	NLL	NLL	1.1E+7	1.2E+6	1.2E+6	1.2E+6	3.1E+7	31,000	NA
Chloride	16887006	NA	5.0E+6	(X)	ID	NLV	NLV	NLV	NLV	ID	5.0E+5 (F)	NA
Chlorobenzene (I)	108907	NA	2,000	500	2.6E+5 (C)	1.2E+5	7.7E+5	9.9E+5	2.1E+6	4.7E+9	2.6E+5 (C)	2.6E+5
p-Chlorobenzene sulfonic acid	98668	NA	1.5E+5	ID	NA	ID	ID	ID	ID	ID	2.3E+8	ID
1-Chloro-1,1-difluoroethane	75683	NA	3.0E+5	NA	9.6E+5 (C)	9.6E+5 (C)	7.9E+7	5.6E+8	1.4E+9	3.3E+12	9.6E+5 (C)	9.6E+5
Chloroethane	75003	NA	8,600	22,000 (X)	9.5E+5 (C)	9.5E+5 (C)	3.0E+7	1.2E+8	2.8E+8	6.7E+11	9.5E+5 (C)	9.5E+5
2-Chloroethyl vinyl ether	110758	NA	ID	NA	ID	ID	ID	ID	ID	ID	ID	1.9E+6
Chloroform	67663	NA	1,600 (W)	7,000	1.5E+6 (C)	7,200	45,000	1.2E+5	2.7E+5	1.3E+9	1.2E+6	1.5E+6
Chloromethane (I)	74873	NA	5,200	ID	1.1E+6 (C)	2,300	40,000	4.1E+5	1.0E+6	4.9E+9	1.1E+6 (C)	1.1E+6
4-Chloro-3-methylphenol	59507	NA	5,800	280	3.0E+6	NLV	NLV	NLV	NLV	ID	4.5E+6	NA
beta-Chloronaphthalene	91587	NA	6.2E+5	NA	2.3E+6	ID	ID	ID	ID	ID	5.6E+7	NA
2-Chlorophenol	95578	NA	900	360	1.9E+6	4.3E+5	9.6E+5	9.6E+5	9.6E+5	1.2E+9	1.4E+6	1.9E+7
o-Chlorotoluene (I)	95498	NA	3,300	ID	5.0E+5 (C)	2.7E+5	1.2E+6	2.9E+6	6.3E+6	4.7E+9	5.0E+5 (C)	5.0E+5
Chlorpyrifos	2921882	NA	17,000	1,500	8.4E+5	130	4,600	23,000	55,000	1.3E+8	1.1E+7	NA
Chromium (III) (B,H)	16065831	18,000 (total)	1.0E+9 (D)	(G,X)	1.0E+9 (D)	NLV	NLV	NLV	NLV	3.3E+8	7.9E+8	NA
Chromium (VI)	18540299	NA	30,000	3,300	1.4E+8	NLV	NLV	NLV	NLV	2.6E+5	2.5E+6	NA
Chrysene (Q)	218019	NA	NLL	NLL	NLL	ID	ID	ID	ID	ID	2.0E+6	NA
Cobalt	7440484	6,800	800	2,000	4.8E+7	NLV	NLV	NLV	NLV	1.3E+7	2.6E+6	NA
Copper (B)	7440508	32,000	5.8E+6	(G)	1.0E+9 (D)	NLV	NLV	NLV	NLV	1.3E+8	2.0E+7	NA
Cyanazine	21725462	NA	200	1,100 (X)	56,000	NLV	NLV	NLV	NLV	ID	14,000	NA

Attachment 1
TABLE 2. SOIL: RESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per kilogram (ug/kg). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic soil criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value. Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

			Groundwater Protection			Indoor Air	Ambient Air (Y)				Direct Contact	
Guidesheet Number →		#10	#11	#12	#13	#14	#15	#16	#17	#18	#19	#20
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
Cyanide (P,R)	57125	390 (total)	4,000	**100**	2.5E+5	NLV	NLV	NLV	NLV	2.5E+5	12,000	NA
Cyclohexanone	108941	NA	5.2E+6	NA	2.2E+8 (C)	17,000	1.0E+6	1.1E+7	2.7E+7	6.7E+10	2.2E+8 (C)	2.2E+8
Dacthal	1861321	NA	50,000	NA	3.4E+5	NLV	NLV	NLV	NLV	ID	2.3E+6	NA
Dalapon	75990	NA	4,000	NA	5.9E+7 (C)	NLV	NLV	NLV	NLV	ID	1.9E+7	5.9E+7
4-4'-DDD	72548	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	4.4E+7	**95,000**	NA
4-4'-DDE	72559	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	3.2E+7	**45,000**	NA
4-4'-DDT	50293	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	3.2E+7	**57,000**	NA
Decabromodiphenyl ether	1163195	NA	1.4E+5	NA	1.4E+5	1.0E+9 (D)	8.6E+7	8.6E+7	8.6E+7	2.3E+9	3.8E+6	NA
Di-n-butyl phthalate	84742	NA	7.6E+5 (C)	**11,000**	7.6E+5 (C)	NLV	NLV	NLV	NLV	3.3E+9	7.6E+5 (C)	7.6E+5
Di(2-ethylhexyl) adipate	103231	NA	9.6E+5 (C)	ID	9.6E+5 (C)	NLV	NLV	NLV	NLV	9.2E+9	9.6E+5 (C,DD)	9.6E+5
Di-n-octyl phthalate	117840	NA	1.0E+8	ID	1.4E+8 (C)	NLV	NLV	NLV	NLV	3.1E+10	6.9E+6	1.4E+8
Diacetone alcohol (I)	123422	NA	ID	NA	ID	NLV	NLV	NLV	NLV	1.6E+11	ID	1.1E+8
Diazinon	333415	NA	95	72	95,000	NLV	NLV	NLV	NLV	ID	12,000 (DD)	3.1E+5
Dibenzo(a,h)anthracene (Q)	53703	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	**2,000**	NA
Dibenzofuran	132649	NA	ID	1,700	ID	2.0E+6	1.3E+5	1.3E+5	1.3E+5	6.7E+6	ID	NA
Dibromochloromethane	124481	NA	1,600 (W)	ID	3.6E+5	3,900	24,000	24,000	33,000	1.3E+8	1.1E+5	6.1E+5
Dibromochloropropane	96128	NA	10 (M); 4.0	ID	1,200 (C)	1,200 (C)	13,000	13,000	13,000	1.3E+7	1,200 (C)	1,200
Dibromomethane	74953	NA	1,600	NA	2.0E+6 (C)	ID	ID	ID	ID	ID	2.0E+6 (C)	2.0E+6
Dicamba	1918009	NA	4,400	NA	1.2E+7	NA	NLV	NLV	NLV	ID	3.4E+6	NA
1,2-Dichlorobenzene	95501	NA	14,000	**280**	2.1E+5 (C)	2.1E+5 (C)	3.9E+7	3.9E+7	5.2E+7	1.0E+11	2.1E+5 (C)	2.1E+5
1,3-Dichlorobenzene	541731	NA	170	680	51,000	26,000	79,000	79,000	1.1E+5	2.0E+8	1.7E+5 (C)	1.7E+5

Attachment 1
TABLE 2. SOIL: RESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per kilogram (ug/kg). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic soil criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value. Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

			Groundwater Protection			Indoor Air	Ambient Air (Y)				Direct Contact	
Guidesheet Number →		#10	#11	#12	#13	#14	#15	#16	#17	#18	#19	#20
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
1,4-Dichlorobenzene	106467	NA	1,700	**360**	1.4E+5	19,000	77,000	77,000	1.1E+5	4.5E+8	4.0E+5	NA
3,3'-Dichlorobenzidine	91941	NA	**2,000 (M); 28**	2,000 (M); 7.4	4,600	NLV	NLV	NLV	NLV	6.5E+6	6,600	NA
Dichlorodifluoromethane	75718	NA	95,000	ID	1.0E+6 (C)	9.0E+5	5.3E+7	5.5E+8	1.4E+9	3.3E+12	1.0E+6 (C)	1.0E+6
1,1-Dichloroethane	75343	NA	18,000	**15,000**	8.9E+5 (C)	2.3E+5	2.1E+6	5.9E+6	1.4E+7	3.3E+10	8.9E+5 (C)	8.9E+5
1,2-Dichloroethane (I)	107062	NA	**100**	7,200 (X)	3.8E+5	2,100	6,200	11,000	26,000	1.2E+8	91,000	1.2E+6
1,1-Dichloroethylene (I)	75354	NA	140	2,600	2.2E+5	**62**	1,100	5,300	13,000	6.2E+7	2.0E+5	5.7E+5
cis-1,2-Dichloroethylene	156592	NA	**1,400**	12,000	6.4E+5 (C)	22,000	1.8E+5	4.2E+5	9.9E+5	2.3E+9	6.4E+5 (C)	6.4E+5
trans-1,2-Dichloroethylene	156605	NA	**2,000**	30,000 (X)	1.4E+6 (C)	23,000	2.8E+5	8.3E+5	2.0E+6	4.7E+9	1.4E+6 (C)	1.4E+6
2,6-Dichloro-4-nitroaniline	99309	NA	44,000	NA	1.4E+5	NLV	NLV	NLV	NLV	ID	6.8E+7	NA
2,4-Dichlorophenol	120832	NA	1,500	**330 (M); 220**	9.6E+5	NLV	NLV	NLV	NLV	5.1E+9	6.6E+5 (DD)	1.8E+6
2,4-Dichlorophenoxyacetic acid	94757	NA	**1,400**	4,400	2.4E+6	NLV	NLV	NLV	NLV	6.7E+9	2.5E+6	NA
1,2-Dichloropropane (I)	78875	NA	**100**	4,600 (X)	3.2E+5	4,000	25,000	50,000	1.1E+5	2.7E+8	1.4E+5	5.5E+5
1,3-Dichloropropene	542756	NA	170	180 (X)	1.1E+5	1,000	18,000	68,000	1.6E+5	7.8E+8	10,000	6.2E+5
Dichlorovos	62737	NA	50 (M); 32	NA	1.2E+5	NLV	NLV	NLV	NLV	3.3E+7	10,000	2.2E+6
Dicyclohexyl phthalate	84617	NA	ID	NA	ID	ID	ID	ID	ID	ID	ID	NA
Dieldrin	60571	NA	NLL	NLL	NLL	1.4E+5	19,000	19,000	19,000	6.8E+5	**1,100**	NA
Diethyl ether	60297	NA	200	ID	7.4E+6 (C)	7.4E+6 (C)	8.5E+7	1.5E+8	3.4E+8	8.0E+11	7.4E+6 (C)	7.4E+6
Diethyl phthalate	84662	NA	1.1E+5	**2,200**	7.4E+5 (C)	NLV	NLV	NLV	NLV	3.3E+9	7.4E+5 (C)	7.4E+5
Diethylene glycol monobutyl ether	112345	NA	1,800	NA	8.0E+7	NLV	NLV	NLV	NLV	1.3E+9	2.7E+6	1.1E+8
Diisopropyl ether	108203	NA	600	ID	1,300 (C)	1,300 (C)	3.4E+5	7.6E+5	1.8E+6	4.1E+9	1,300 (C)	1,300
Diisopropylamine (I)	108189	NA	110	NA	4.2E+5	5.5E+6	6.2E+6	6.2E+6	7.3E+6	1.3E+10	1.7E+5	6.7E+6

Attachment 1
TABLE 2. SOIL: RESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per kilogram (ug/kg). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic soil criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value. Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

			Groundwater Protection			Indoor Air	Ambient Air (Y)				Direct Contact	
Guidesheet Number →		#10	#11	#12	#13	#14	#15	#16	#17	#18	#19	#20
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
Dimethyl phthalate	131113	NA	7.9E+5 (C)	NA	7.9E+5 (C)	NLV	NLV	NLV	NLV	3.3E+9	7.9E+5 (C)	7.9E+5
N,N-Dimethylacetamide	127195	NA	3,600	82,000 (X)	1.1E+8 (C)	NLV	NLV	NLV	NLV	ID	5.6E+6	1.1E+8
N,N-Dimethylaniline	121697	NA	320	NA	4.0E+5	1.7E+5	1.5E+5	1.5E+5	1.5E+5	2.6E+8	5.0E+5	8.0E+5
Dimethylformamide (I)	68122	NA	14,000	NA	1.1E+8 (C)	NLV	NLV	NLV	NLV	2.0E+9	2.2E+7	1.1E+8
2,4-Dimethylphenol	105679	NA	7,400	7,600	1.0E+7	NLV	NLV	NLV	NLV	4.7E+9	1.1E+7	NA
2,6-Dimethylphenol	576261	NA	330 (M); 88	NA	1.3E+5	NLV	NLV	NLV	NLV	1.3E+8	1.4E+5	NA
3,4-Dimethylphenol	95658	NA	330 (M); 200	NA	3.6E+5	NLV	NLV	NLV	NLV	2.3E+8	3.2E+5	NA
Dimethylsulfoxide	67685	NA	4.4E+6	3.8E+6	1.8E+7 (C)	NLV	NLV	NLV	NLV	1.3E+9	1.8E+7 (C)	1.8E+7
2,4-Dinitrotoluene	121142	NA	430	NA	1.7E+5	NLV	NLV	NLV	NLV	1.6E+7	48,000	NA
Dinoseb	88857	NA	300	200 (M); 43	1.4E+5 (C)	NLV	NLV	NLV	NLV	2.7E+8	66,000 (DD)	1.4E+5
1,4-Dioxane (I)	123911	NA	1,700	56,000 (X)	3.4E+7	NLV	NLV	NLV	NLV	5.7E+8	5.3E+5	9.7E+7
Diquat	85007	NA	400	NA	1.4E+7	NLV	NLV	NLV	NLV	ID	5.0E+5	NA
Diuron	330541	NA	620	NA	7.4E+5	NLV	NLV	NLV	NLV	4.7E+8	9.7E+5	NA
Endosulfan (J)	115297	NA	NLL	NLL	NLL	ID	ID	ID	ID	ID	1.4E+6	NA
Endothall	145733	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	2.3E+9	3.8E+6	NA
Endrin	72208	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	65,000	NA
Epichlorohydrin (I)	106898	NA	100	NA	2.2E+5	64,000	31,000	31,000	35,000	6.7E+7	8,900	7.3E+6
Ethanol (I)	64175	NA	3.8E+7	ID	1.1E+8 (C)	NLV	NLV	NLV	NLV	1.3E+12	1.1E+8 (C,DD)	1.1E+8
Ethyl acetate (I)	141786	NA	1.3E+5	NA	7.5E+6 (C)	7.5E+6 (C)	4.9E+7	4.9E+7	9.8E+7	2.1E+11	7.5E+6 (C)	7.5E+6
Ethyl-tert-butyl ether (ETBE)	637923	NA	980	ID	ID	5.4E+5	1.9E+6	4.5E+6	1.1E+7	2.5E+10	ID	6.5E+5
Ethylbenzene (I)	100414	NA	1,500	360	1.4E+5 (C)	87,000	7.2E+5	1.0E+6	2.2E+6	1.0E+10	1.4E+5 (C)	1.4E+5

Attachment 1
TABLE 2. SOIL: RESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per kilogram (ug/kg). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic soil criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value. Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

			Groundwater Protection			Indoor Air	Ambient Air (Y)				Direct Contact	
Guidesheet Number ⟶		#10	#11	#12	#13	#14	#15	#16	#17	#18	#19	#20
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
Ethylene dibromide	106934	NA	**20 (M); 1.0**	110 (X)	500	670	1,700	1,700	3,300	1.4E+7	92	8.9E+5
Ethylene glycol	107211	NA	3.0E+5	3.8E+6 (X)	1.1E+8 (C)	NLV	NLV	NLV	NLV	6.7E+10	1.1E+8 (C)	1.1E+8
Ethylene glycol monobutyl ether	111762	NA	74,000	NA	4.1E+7 (C)	7.4E+5	1.8E+7	1.5E+8	3.6E+8	8.7E+11	4.1E+7 (C)	4.1E+7
Fluoranthene	206440	NA	7.3E+5	**5,500**	7.3E+5	1.0E+9 (D)	7.4E+8	7.4E+8	7.4E+8	9.3E+9	4.6E+7	NA
Fluorene	86737	NA	3.9E+5	**5,300**	8.9E+5	5.8E+8	1.3E+8	1.3E+8	1.3E+8	9.3E+9	2.7E+7	NA
Fluorine (soluble fluoride) (B)	7782414	NA	40,000	ID	2.4E+8	NLV	NLV	NLV	NLV	ID	9.0E+6 (DD)	NA
Formaldehyde	50000	NA	26,000	**2,400**	6.0E+7 (C)	12,000	13,000	23,000	52,000	2.4E+8	4.1E+7	6.0E+7
Formic acid (I,U)	64186	NA	2.0E+5	ID	1.1E+8 (C)	1.5E+6	2.1E+5	1.4E+5	1.4E+5	1.3E+8	1.1E+8 (C)	1.1E+8
1-Formylpiperidine	2591868	NA	1,600	NA	ID	ID	ID	ID	ID	ID	2.5E+6	1.0E+7
Gentian violet	548629	NA	300	NA	2.0E+7	NLV	NLV	NLV	NLV	ID	96,000	NA
Glyphosate	1071836	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	**1.1E+7 (DD)**	NA
Heptachlor	76448	NA	NLL	NLL	NLL	3.5E+5	62,000	62,000	62,000	2.4E+6	**5,600**	NA
Heptachlor epoxide	1024573	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	1.2E+6	**3,100**	NA
n-Heptane	142825	NA	2.4E+5 (C)	NA	2.4E+5 (C)	2.4E+5 (C)	2.1E+7	4.4E+7	1.0E+8	2.3E+11	2.4E+5 (C)	2.4E+5
Hexabromobenzene	87821	NA	5,400	ID	5,400	ID	ID	ID	ID	ID	1.1E+6	NA
Hexachlorobenzene (C-66)	118741	NA	1,800	**350**	8,200	41,000	17,000	17,000	17,000	6.8E+6	8,900	NA
Hexachlorobutadiene (C-46)	87683	NA	26,000	**91**	3.5E+5 (C)	1.3E+5	1.3E+5	1.3E+5	1.3E+5	1.4E+8	1.0E+5	3.5E+5
alpha-Hexachlorocyclohexane	319846	NA	18	ID	2,500	30,000	12,000	22,000	25,000	1.7E+6	2,600	NA
beta-Hexachlorocyclohexane	319857	NA	37	ID	5,100	NLV	NLV	NLV	NLV	5.9E+6	5,400	NA
Hexachlorocyclopentadiene (C-56)	77474	NA	3.2E+5	ID	7.2E+5 (C)	30,000	50,000	50,000	50,000	1.3E+7	7.2E+5 (C)	7.2E+5
Hexachloroethane	67721	NA	**430**	1,800 (X)	1.1E+5	40,000	5.5E+5	9.3E+5	9.3E+5	2.3E+8	2.3E+5	NA

Attachment 1
TABLE 2. SOIL: RESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per kilogram (ug/kg). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic soil criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value. Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

			Groundwater Protection			Indoor Air	Ambient Air (Y)				Direct Contact	
Guidesheet Number ⟶		#10	#11	#12	#13	#14	#15	#16	#17	#18	#19	#20
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
n-Hexane	110543	NA	44,000 (C)	NA	44,000 (C)	44,000 (C)	3.0E+6	3.2E+6	6.2E+6	1.3E+10	44,000 (C)	44,000
2-Hexanone	591786	NA	20,000	ID	2.5E+6 (C)	9.9E+5	1.1E+6	1.1E+6	1.4E+6	2.7E+9	2.5E+6 (C)	2.5E+6
Indeno(1,2,3-cd)pyrene (Q)	193395	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	**20,000**	NA
Iron (B)	7439896	1.2E+7	6,000	NA	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	1.6E+8	NA
Isobutyl alcohol (I)	78831	NA	46,000	NA	8.9E+6 (C)	8.9E+6 (C)	7.9E+7	7.9E+7	7.9E+7	1.0E+11	8.9E+6 (C)	8.9E+6
Isophorone	78591	NA	15,000	**26,000 (X)**	2.4E+6 (C)	NLV	NLV	NLV	NLV	1.2E+10	2.4E+6 (C)	2.4E+6
Isopropyl alcohol (I)	67630	NA	**9,400**	1.1E+6 (X)	1.1E+8 (C)	NLV	NLV	NLV	NLV	1.5E+10	1.4E+7	1.1E+8
Isopropyl benzene	98828	NA	91,000	3,200	3.9E+5 (C)	3.9E+5 (C)	1.7E+6	1.7E+6	2.8E+6	5.8E+9	3.9E+5 (C)	3.9E+5
Lead (B)	7439921	21,000	7.0E+5	(G,X)	ID	NLV	NLV	NLV	NLV	1.0E+8	4.0E+5	NA
Lindane	58899	NA	20 (M); 7.0	20 (M); 1.1	7,100	ID	ID	ID	ID	ID	8,300	NA
Lithium (B)	7439932	9,800	3,400	**8,800**	1.1E+8	NLV	NLV	NLV	NLV	ID	4.2E+6 (DD)	NA
Magnesium (B)	7439954	NA	8.0E+6	NA	1.0E+9 (D)	NLV	NLV	NLV	NLV	6.7E+9	1.0E+9 (D)	NA
Manganese (B)	7439965	4.4E+5	1,000	(G,X)	1.8E+8	NLV	NLV	NLV	NLV	3.3E+6	2.5E+7	NA
Mercury (Total) (B,Z)	Varies	130	1,700	**50 (M); 1.2**	47,000	48,000	52,000	52,000	52,000	2.0E+7	1.6E+5	NA
Methane	74828	NA	ID	NA	ID	8.4E+6 ug/m3 (GG)	ID	ID	ID	ID	ID	ID
Methanol	67561	NA	74,000	3.1E+6 (C)	3.1E+6 (C)	3.1E+6 (C)	3.1E+7	4.4E+7	9.6E+7	2.2E+11	3.1E+6 (C)	3.1E+6
Methoxychlor	72435	NA	16,000	NA	18,000	ID	ID	ID	ID	ID	1.9E+6	NA
2-Methoxyethanol (I)	109864	NA	150	NA	1.7E+7	NLV	NLV	NLV	NLV	1.3E+9	2.3E+5	1.1E+8
2-Methyl-4-chlorophenoxyacetic acid	94746	NA	390	NA	4.9E+5	NLV	NLV	NLV	NLV	ID	2.3E+5	NA
2-Methyl-4,6-dinitrophenol	534521	NA	830 (M); 400	NA	1.9E+5	NLV	NLV	NLV	NLV	ID	79,000	NA
N-Methyl-morpholine (I)	109024	NA	400	NA	3.0E+7	NLV	NLV	NLV	NLV	ID	6.1E+5	1.1E+8

Attachment 1
TABLE 2. SOIL: RESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per kilogram (ug/kg). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic soil criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value. Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

			Groundwater Protection			Indoor Air	Ambient Air (Y)				Direct Contact	
Guidesheet Number →		#10	#11	#12	#13	#14	#15	#16	#17	#18	#19	#20
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
Methyl parathion	298000	NA	46	NA	76,000	NLV	NLV	NLV	NLV	ID	56,000	NA
4-Methyl-2-pentanone (MIBK) (I)	108101	NA	36,000	ID	2.7E+6 (C)	2.7E+6 (C)	4.5E+7	4.5E+7	6.7E+7	1.4E+11	2.7E+6 (C)	2.7E+6
Methyl-tert-butyl ether (MTBE)	1634044	NA	800	1.4E+5 (X)	5.9E+6 (C)	5.9E+6 (C)	2.5E+7	3.9E+7	8.7E+7	2.0E+11	1.5E+6	5.9E+6
Methylcyclopentane (I)	96377	NA	ID	NA	ID	92,000	2.3E+6	8.2E+6	2.0E+7	4.7E+10	ID	3.5E+5
4,4'-Methylene-bis-2-chloroaniline (MBOCA)	101144	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	8.4E+7	6,800	NA
Methylene chloride	75092	NA	100	30,000 (X)	2.3E+6 (C)	45,000	2.1E+5	5.9E+5	1.4E+6	6.6E+9	1.3E+6	2.3E+6
2-Methylnaphthalene	91576	NA	57,000	4,200	5.5E+6	2.7E+6	1.5E+6	1.5E+6	1.5E+6	6.7E+8	8.1E+6	NA
Methylphenols (J)	1319773	NA	7,400	1,000 (M); 600	1.6E+7	NLV	NLV	NLV	NLV	6.7E+9	1.1E+7	NA
Metolachlor	51218452	NA	4,800	300	4.4E+5 (C)	NLV	NLV	NLV	NLV	ID	4.4E+5 (C,DD)	4.4E+5
Metribuzin	21087649	NA	3,600	NA	2.4E+7	ID	ID	ID	ID	ID	9.6E+6	NA
Mirex	2385855	NA	NLL	NLL	NLL	ID	ID	ID	ID	ID	9,600	NA
Molybdenum (B)	7439987	NA	1,500	64,000 (X)	1.9E+7	NLV	NLV	NLV	NLV	ID	2.6E+6	NA
Naphthalene	91203	NA	35,000	730	2.1E+6	2.5E+5	3.0E+5	3.0E+5	3.0E+5	2.0E+8	1.6E+7	NA
Nickel (B)	7440020	20,000	1.0E+5	(G)	1.0E+9 (D)	NLV	NLV	NLV	NLV	1.3E+7	4.0E+7	NA
Nitrate (B,N)	14797558	NA	2.0E+5 (N)	ID	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	ID	NA
Nitrite (B,N)	14797650	NA	20,000 (N)	NA	3.8E+8	NLV	NLV	NLV	NLV	ID	ID	NA
Nitrobenzene (I)	98953	NA	330 (M); 68	3,600 (X)	2.2E+5	91,000	54,000	54,000	54,000	4.7E+7	1.0E+5	4.9E+5
2-Nitrophenol	88755	NA	400	ID	1.6E+6	NLV	NLV	NLV	NLV	ID	6.3E+5	NA
n-Nitroso-di-n-propylamine	621647	NA	330 (M); 100	NA	7,200	NLV	NLV	NLV	NLV	1.6E+6	1,200	1.5E+6
N-Nitrosodiphenylamine	86306	NA	5,400	NA	7.0E+5	NLV	NLV	NLV	NLV	2.2E+9	1.7E+6	NA

Attachment 1
TABLE 2. SOIL: RESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per kilogram (ug/kg). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic soil criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value. Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

			Groundwater Protection			Indoor Air	Ambient Air (Y)				Direct Contact	
Guidesheet Number ⟶		#10	#11	#12	#13	#14	#15	#16	#17	#18	#19	#20
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
Oxamyl	23135220	NA	4,000	NA	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	8.6E+6	NA
Oxo-hexyl acetate	88230357	NA	1,500	NA	ID	ID	ID	ID	ID	5.4E+9	2.3E+6	1.0E+7
Pendimethalin	40487421	NA	1.1E+6	NA	1.1E+6	NLV	NLV	NLV	NLV	ID	4.6E+7	NA
Pentachlorobenzene	608935	NA	29,000	9,500	1.9E+5 (C)	ID	ID	ID	ID	ID	1.9E+5 (C)	1.9E+5
Pentachloronitrobenzene	82688	NA	37,000	NA	37,000	1.2E+5	2.3E+5	2.3E+5	2.3E+5	3.3E+8	1.7E+6	NA
Pentachlorophenol	87865	NA	22	(G,X)	4,300	NLV	NLV	NLV	NLV	1.0E+8	90,000	NA
Pentane	109660	NA	ID	NA	ID	2.4E+5 (C)	3.7E+7	3.1E+8	5.8E+8	1.2E+12	ID	2.4E+5
2-Pentene (I)	109682	NA	ID	NA	ID	ID	ID	ID	ID	ID	ID	2.2E+5
Phenanthrene	85018	NA	56,000	2,100	1.1E+6	2.8E+6	1.6E+5	1.6E+5	1.6E+5	6.7E+6	1.6E+6	NA
Phenol	108952	NA	88,000	9,000	1.2E+7 (C)	NLV	NLV	NLV	NLV	4.0E+10	1.2E+7 (C,DD)	1.2E+7
Phosphorus (Total)	7723140	NA	1.3E+6	(EE)	ID	NLV	NLV	NLV	NLV	6.7E+7	1.0E+9 (D)	NA
Phthalic acid	88993	NA	2.8E+5	NA	1.7E+6 (C)	NLV	NLV	NLV	NLV	ID	1.7E+6 (C)	1.7E+6
Phthalic anhydride	85449	NA	3.0E+5	NA	1.1E+6 (C)	NLV	NLV	NLV	NLV	ID	1.1E+6 (C)	1.1E+6
Picloram	1918021	NA	10,000	920	8.6E+6	NLV	NLV	NLV	NLV	ID	1.6E+7	NA
Piperidine	110894	NA	64	NA	6.8E+5	NLV	NLV	NLV	NLV	9.3E+9	99,000	1.2E+8
Polybrominated biphenyls (J)	67774327	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	1,200	NA
Polychlorinated biphenyls (PCBs) (J,T)	1336363	NA	NLL	NLL	NLL	3.0E+6	2.4E+5	7.9E+6	7.9E+6	5.2E+6	(T)	NA
Prometon	1610180	NA	4,900	NA	5.5E+6	NLV	NLV	NLV	NLV	ID	5.0E+6	NA
Propachlor	1918167	NA	1,900	NA	8.8E+6	NLV	NLV	NLV	NLV	ID	2.9E+6	NA
Propazine	139402	NA	4,000	NA	1.7E+5	NLV	NLV	NLV	NLV	ID	6.1E+6	NA
Propionic acid	79094	NA	2.4E+5	ID	1.1E+8 (C)	NLV	NLV	NLV	NLV	2.0E+10	1.1E+8 (C)	1.1E+8

Attachment 1
TABLE 2. SOIL: RESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per kilogram (ug/kg). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic soil criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value. Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

			Groundwater Protection			Indoor Air	Ambient Air (Y)				Direct Contact	
Guidesheet Number ⟶		#10	#11	#12	#13	#14	#15	#16	#17	#18	#19	#20
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
Propyl alcohol (I)	71238	NA	28,000	NA	1.1E+8 (C)	NLV	NLV	NLV	NLV	4.9E+10	1.3E+7 (DD)	1.1E+8
n-Propylbenzene (I)	103651	NA	1,600	ID	3.0E+5	ID	ID	ID	ID	1.3E+9	2.5E+6	1.0E+7
Propylene glycol	57556	NA	3.0E+6	5.8E+6	1.1E+8 (C)	NLV	NLV	NLV	NLV	4.0E+11	1.1E+8 (C)	1.1E+8
Pyrene	129000	NA	4.8E+5	ID	4.8E+5	1.0E+9 (D)	6.5E+8	6.5E+8	6.5E+8	6.7E+9	2.9E+7	NA
Pyridine (I)	110861	NA	400	NA	37,000 (C)	1,100	8,200	40,000	97,000	2.3E+8	37,000 (C)	37,000
Selenium (B)	7782492	410	4,000	400	7.8E+7	NLV	NLV	NLV	NLV	1.3E+8	2.6E+6	NA
Silver (B)	7440224	1,000	4,500	100 (M); 27	2.0E+8	NLV	NLV	NLV	NLV	6.7E+6	2.5E+6	NA
Silvex (2,4,5-TP)	93721	NA	3,600	2,200	3.1E+6	NLV	NLV	NLV	NLV	ID	1.7E+6	NA
Simazine	122349	NA	80	340	90,000	NLV	NLV	NLV	NLV	ID	1.2E+6	NA
Sodium	17341252	NA	2.5E+6	NA	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	1.0E+9 (D)	NA
Sodium azide	26628228	NA	1,800	1,000	ID	ID	ID	ID	ID	ID	2.7E+6	NA
Strontium (B)	7440246	NA	92,000	4.2E+5	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	3.3E+8	NA
Styrene	100425	NA	2,700	2,100 (X)	2.7E+5	2.5E+5	9.7E+5	9.7E+5	1.4E+6	5.5E+9	4.0E+5	5.2E+5
Sulfate	14808798	NA	5.0E+6	NA	ID	NLV	NLV	NLV	NLV	ID	ID	NA
Tebuthiuron	34014181	NA	10,000	NA	5.0E+7	NLV	NLV	NLV	NLV	ID	4.6E+6 (DD)	NA
2,3,7,8-Tetrabromodibenzo-p-dic (O)	50585416	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	(O)	(O)	NA
1,2,4,5-Tetrachlorobenzene	95943	NA	1.5E+6	3,400 (X)	1.5E+6	5.8E+5	2.3E+5	2.3E+5	2.3E+5	6.7E+7	7.7E+7	NA
2,3,7,8-Tetrachlorodibenzo-p-dic (O)	1746016	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	71 (O)	0.09 (O)	NA
1,1,1,2-Tetrachloroethane	630206	NA	1,500	ID	4.4E+5 (C)	6,200	36,000	54,000	1.0E+5	4.2E+8	4.4E+5 (C)	4.4E+5
1,1,2,2-Tetrachloroethane	79345	NA	170	1,600 (X)	94,000	4,300	10,000	10,000	14,000	5.4E+7	53,000	8.7E+5
Tetrachloroethylene	127184	NA	100	1,200 (X)	88,000 (C)	11,000	1.8E+5	4.8E+5	1.1E+6	5.4E+9	88,000 (C)	88,000

Attachment 1
TABLE 2. SOIL: RESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per kilogram (ug/kg). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic soil criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value. Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

			Groundwater Protection			Indoor Air	Ambient Air (Y)				Direct Contact	
Guidesheet Number →		#10	#11	#12	#13	#14	#15	#16	#17	#18	#19	#20
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
Tetrahydrofuran	109999	NA	1,900	2.2E+5 (X)	3.2E+7	1.3E+6	1.3E+7	6.7E+7	1.6E+8	3.9E+11	2.9E+6	1.2E+8
Tetranitromethane	509148	NA	ID	NA	ID	500(M); 110	500 (M); 51	ID	ID	2.1E+5	ID	ID
Thallium (B)	7440280	NA	2,300	4,200 (X)	1.5E+7	NLV	NLV	NLV	NLV	1.3E+7	35,000	NA
Toluene (I)	108883	NA	16,000	5,400	2.5E+5 (C)	2.5E+5 (C)	2.8E+6	5.1E+6	1.2E+7	2.7E+10	2.5E+5 (C)	2.5E+5
p-Toluidine	106490	NA	660 (M); 300	NA	4.8E+5	NLV	NLV	NLV	NLV	1.0E+8	94,000	1.2E+6
Toxaphene	8001352	NA	24,000	8,200	3.6E+5	NLV	NLV	NLV	NLV	9.7E+6	20,000	NA
Triallate	2303175	NA	95,000	NA	2.5E+5 (C)	ID	ID	ID	ID	ID	2.5E+5 (C)	2.5E+5
Tributylamine	102829	NA	7,800	ID	1.8E+6	5.8E+5	6.0E+5	6.0E+5	6.0E+5	4.7E+8	7.9E+5	3.7E+6
1,2,4-Trichlorobenzene	120821	NA	4,200	5,900 (X)	1.1E+6 (C)	1.1E+6 (C)	2.8E+7	2.8E+7	2.8E+7	2.5E+10	9.9E+5 (DD)	1.1E+6
1,1,1-Trichloroethane	71556	NA	4,000	1,800	4.6E+5 (C)	2.5E+5	3.8E+6	1.2E+7	2.8E+7	6.7E+10	4.6E+5 (C)	4.6E+5
1,1,2-Trichloroethane	79005	NA	100	6,600 (X)	4.2E+5	4,600	17,000	21,000	44,000	1.9E+8	1.8E+5	9.2E+5
Trichloroethylene	79016	NA	100	4,000 (X)	4.4E+5	7,100	78,000	1.7E+5	3.9E+5	1.8E+9	5.0E+5 (C,DD)	5.0E+5
Trichlorofluoromethane	75694	NA	52,000	NA	5.6E+5 (C)	5.6E+5 (C)	9.2E+7	6.3E+8	1.5E+9	3.8E+12	5.6E+5 (C)	5.6E+5
2,4,5-Trichlorophenol	95954	NA	39,000	NA	9.1E+6	NLV	NLV	NLV	NLV	2.3E+10	2.3E+7	NA
2,4,6-Trichlorophenol	88062	NA	2,400	330 (M); 100	2.0E+5	NLV	NLV	NLV	NLV	1.0E+9	7.1E+5	NA
1,2,3-Trichloropropane	96184	NA	840	NA	8.3E+5 (C)	4,000	9,200	9,200	11,000	2.0E+7	8.3E+5 (C)	8.3E+5
1,1,2-Trichloro-1,2,2-trifluoroetha	76131	NA	5.5E+5 (C)	1,700	5.5E+5 (C)	5.5E+5 (C)	1.8E+8	8.8E+8	2.1E+9	5.1E+12	5.5E+5 (C)	5.5E+5
Triethanolamine	102716	NA	74,000	NA	1.1E+8 (C)	NLV	NLV	NLV	NLV	3.3E+9	1.1E+8	1.1E+8
Triethylene glycol	112276	NA	1.1E+5 (C)	NA	1.1E+5 (C)	NLV	NLV	NLV	NLV	ID	1.1E+5 (C,DD)	1.1E+5
3-Trifluoromethyl-4-nitrophenol	88302	NA	1.1E+5	NA	1.2E+8	NLV	NLV	NLV	NLV	ID	4.1E+7 (DD)	NA
Trifluralin	1582098	NA	1.9E+5	NA	1.2E+7	ID	ID	ID	ID	ID	2.0E+6	NA

Attachment 1
TABLE 2. SOIL: RESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per kilogram (ug/kg). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic soil criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value. Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

			Groundwater Protection			Indoor Air	Ambient Air (Y)				Direct Contact	
Guidesheet Number →		#10	#11	#12	#13	#14	#15	#16	#17	#18	#19	#20
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
2,2,4-Trimethyl pentane	540841	NA	ID	NA	ID	19,000 (C)	5.2E+6	3.9E+7	9.6E+7	2.3E+11	ID	19,000
2,4,4-Trimethyl-2-pentene (I)	107404	NA	ID	NA	ID	ID	ID	ID	ID	ID	ID	56,000
1,2,4-Trimethylbenzene (I)	95636	NA	2,100	**570**	1.1E+5 (C)	1.1E+5 (C)	2.1E+7	5.0E+8	5.0E+8	8.2E+10	1.1E+5 (C)	1.1E+5
1,3,5-Trimethylbenzene (I)	108678	NA	1,800	**1,100**	94,000 (C)	94,000 (C)	1.6E+7	3.8E+8	3.8E+8	8.2E+10	94,000 (C)	94,000
Triphenyl phosphate	115866	NA	1.1E+5 (C)	NA	1.1E+5 (C)	NLV	NLV	NLV	NLV	ID	1.1E+5 (C)	1.1E+5
tris(2,3-Dibromopropyl)phosphat	126727	NA	930	ID	27,000 (C)	27,000 (C)	18,000	18,000	18,000	5.9E+6	4,400	27,000
Urea	57136	NA	ID	NA	ID	NLV	NLV	NLV	NLV	ID	ID	NA
Vanadium	7440622	NA	**72,000**	1.9E+5	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	7.5E+5 (DD)	NA
Vinyl acetate (I)	108054	NA	13,000	NA	2.4E+6 (C)	7.9E+5	1.7E+6	2.6E+6	5.8E+6	1.3E+10	2.4E+6 (C,DD)	2.4E+6
Vinyl chloride	75014	NA	**40**	260 (X)	20,000	270	4,200	30,000	73,000	3.5E+8	3,800	4.9E+5
White phosphorus (R)	12185103	NA	2.2	NA	58,000	NLV	NLV	NLV	NLV	ID	2,300 (DD)	NA
Xylenes (I)	1330207	NA	5,600	**820**	1.5E+5 (C)	1.5E+5 (C)	4.6E+7	6.1E+7	1.3E+8	2.9E+11	1.5E+5 (C)	1.5E+5
Zinc (B)	7440666	47,000	2.4E+6	(G)	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	1.7E+8	NA

Attachment 1
TABLE 3. SOIL: NONRESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per kilogram (ug/kg). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic soil criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value. Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

			Groundwater Protection				Indoor Air	Ambient Air (Y)				Direct Contact	
Guidesheet Number ——>		#10	#11	#21	#12	#13	#22	#23	#24	#25	#26	#27	#20
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Residential Drinking Water Protection Criteria & RBSLs	Non-Residential Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
Acenaphthene	83329	NA	3.0E+5	8.8E+5	8,700	9.7E+5	3.5E+8	9.7E+7	9.7E+7	9.7E+7	6.2E+9	1.3E+8	NA
Acenaphthylene	208968	NA	5,900	17,000	ID	4.4E+5	3.0E+6	2.7E+6	2.7E+6	2.7E+6	1.0E+9	5.2E+6	NA
Acetaldehyde (I)	75070	NA	19,000	54,000	2,600	1.1E+8 (C)	4.0E+5	2.1E+5	2.1E+5	2.9E+5	2.6E+8	9.5E+7	1.1E+8
Acetate	71501	NA	ID	ID	(G)	ID	ID	ID	ID	ID	ID	ID	ID
Acetic acid	64197	NA	84,000	2.4E+5	(G)	6.5E+8 (C)	NLV	NLV	NLV	NLV	7.4E+9	4.2E+8	6.5E+8
Acetone (I)	67641	NA	15,000	42,000	34,000	1.1E+8 (C)	1.1E+8 (C)	1.6E+8	1.6E+8	2.0E+8	1.7E+11	7.3E+7	1.1E+8
Acetonitrile	75058	NA	2,800	8,000	NA	2.2E+7 (C)	8.8E+6	1.9E+6	1.9E+6	2.2E+6	1.8E+9	1.4E+7	2.2E+7
Acetophenone	98862	NA	30,000	88,000	ID	1.1E+6 (C)	1.1E+6 (C)	5.2E+7	5.2E+7	5.2E+7	1.4E+10	1.1E+6 (C)	1.1E+6
Acrolein (I)	107028	NA	2,400	6,600	NA	2.3E+7 (C)	760	370	370	630	5.9E+5	1.2E+7	2.3E+7
Acrylamide	79061	NA	10	10	200 (X)	2.6E+5	NLV	NLV	NLV	NLV	3.0E+6	8,700	NA
Acrylic acid	79107	NA	78,000	2.2E+5	NA	1.1E+8 (C)	5.5E+6	2.2E+5	2.7E+5	2.7E+5	2.9E+7	1.1E+8 (C,DD)	1.1E+8
Acrylonitrile (I)	107131	NA	100 (M); 52	220	100 (M); 40	2.8E+5	35,000	17,000	17,000	31,000	5.8E+7	74,000	8.3E+6
Alachlor	15972608	NA	52	52	290 (X)	44,000	NLV	NLV	NLV	NLV	ID	3.9E+5	NA
Aldicarb	116063	NA	60	60	NA	2.4E+6	NLV	NLV	NLV	NLV	ID	7.3E+5	NA
Aldicarb sulfone	1646884	NA	200 (M); 40	200 (M); 40	NA	4.2E+7	NLV	NLV	NLV	NLV	ID	8.0E+5	NA
Aldicarb sulfoxide	1646873	NA	200(M); 80	200 (M); 80	NA	5.4E+7	NLV	NLV	NLV	NLV	ID	9.5E+5	NA
Aldrin	309002	NA	NLL	NLL	NLL	NLL	7.1E+6	2.0E+5	2.0E+5	2.0E+5	8.0E+5	4,300	NA
Aluminum (B)	7429905	6.9E+6	1,000	1,000	NA	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	3.7E+8 (DD)	NA
Ammonia	7664417	NA	ID	ID	(CC)	ID	ID	ID	ID	ID	2.9E+9	ID	1.0E+7
t-Amyl methyl ether (TAME)	994058	NA	3,900	3,900	NA	4.4E+5 (C)	1.1E+5	4.0E+5	7.8E+5	1.8E+6	1.8E+9	4.4E+5 (C)	4.4E+5
Aniline	62533	NA	1,100	4,400	330 (M); 80	2.8E+6	NLV	NLV	NLV	NLV	2.9E+7	1.5E+6	4.5E+6

Attachment 1
TABLE 3. SOIL: NONRESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per kilogram (ug/kg). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic soil criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value. Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

			Groundwater Protection				Indoor Air	Ambient Air (Y)				Direct Contact	
Guidesheet Number ——>		#10	#11	#21	#12	#13	#22	#23	#24	#25	#26	#27	#20
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Residential Drinking Water Protection Criteria & RBSLs	Non-Residential Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
Anthracene	120127	NA	41,000	41,000	ID	41,000	1.0E+9 (D)	1.6E+9	1.6E+9	1.6E+9	2.9E+10	7.3E+8	NA
Antimony	7440360	NA	4,300	4,300	94,000 (X)	4.9E+7	NLV	NLV	NLV	NLV	5.9E+6	6.7E+5	NA
Arsenic	7440382	5,800	4,600	4,600	4,600	2.0E+6	NLV	NLV	NLV	NLV	9.1E+5	37,000	NA
Asbestos (BB)	1332214	NA	NLL	NLL	NLL	NLL	NLV	NLV	NLV	NLV	1.0E+7 (M); 85,000	ID	NA
Atrazine	1912249	NA	60	60	150	1.1E+5	NLV	NLV	NLV	NLV	ID	3.3E+5 (DD)	NA
Azobenzene	103333	NA	4,200	17,000	ID	3.0E+5	3.2E+7	2.1E+6	2.1E+6	2.1E+6	1.3E+8	6.6E+5	NA
Barium (B)	7440393	75,000	1.3E+6	1.3E+6	(G)	1.0E+9 (D)	NLV	NLV	NLV	NLV	1.5E+8	1.3E+8	NA
Benzene (I)	71432	NA	100	100	4,000 (X)	2.2E+5	8,400	45,000	99,000	2.3E+5	4.7E+8	4.0E+5 (C)	4.0E+5
Benzidine	92875	NA	1,000 (M); 6.0	1,000 (M); 6.0	1,000 (M); 6.0	1,000 (M); 140	NLV	NLV	NLV	NLV	59,000	1,000 (M); 110	NA
Benzo(a)anthracene (Q)	56553	NA	NLL	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	80,000	NA
Benzo(b)fluoranthene (Q)	205992	NA	NLL	NLL	NLL	NLL	ID	ID	ID	ID	ID	80,000	NA
Benzo(k)fluoranthene (Q)	207089	NA	NLL	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	8.0E+5	NA
Benzo(g,h,i)perylene	191242	NA	NLL	NLL	NLL	NLL	NLV	NLV	NLV	NLV	3.5E+8	7.0E+6	NA
Benzo(a)pyrene (Q)	50328	NA	NLL	NLL	NLL	NLL	NLV	NLV	NLV	NLV	1.9E+6	8,000	NA
Benzoic acid	65850	NA	6.4E+5	1.8E+6	NA	7.0E+7	NLV	NLV	NLV	NLV	ID	1.0E+9 (D)	NA
Benzyl alcohol	100516	NA	2.0E+5	5.8E+5	NA	5.8E+6 (C)	NLV	NLV	NLV	NLV	1.5E+11	5.8E+6 (C)	5.8E+6
Benzyl chloride	100447	NA	150	640	NA	72,000	33,000	48,000	48,000	52,000	7.8E+7	2.2E+5	2.3E+5
Beryllium	7440417	NA	51,000	51,000	(G)	1.0E+9 (D)	NLV	NLV	NLV	NLV	5.9E+5	1.6E+6	NA
bis(2-Chloroethoxy)ethane	112265	NA	ID	ID	ID	ID	NLV	NLV	NLV	NLV	ID	ID	2.7E+6
bis(2-Chloroethyl)ether (I)	111444	NA	100	170	100 (M); 20	1.1E+5	44,000	13,000	13,000	13,000	1.2E+7	58,000	2.2E+6

Attachment 1
TABLE 3. SOIL: NONRESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per kilogram (ug/kg). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic soil criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value. Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

			Groundwater Protection				Indoor Air	Ambient Air (Y)				Direct Contact	
Guidesheet Number ——>		#10	#11	#21	#12	#13	#22	#23	#24	#25	#26	#27	#20
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Residential Drinking Water Protection Criteria & RBSLs	Non-Residential Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
bis(2-Ethylhexyl)phthalate	117817	NA	NLL	NLL	NLL	NLL	NLV	NLV	NLV	NLV	8.9E+8	1.0E+7 (C)	1.0E+7
Boron (B)	7440428	NA	10,000	10,000	1.0E+5 (X)	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	3.5E+8 (DD)	NA
Bromate	15541454	NA	200	200	800 (X)	96,000	NLV	NLV	NLV	NLV	ID	91,000	NA
Bromobenzene (I)	108861	NA	550	1,500	NA	3.6E+5	5.8E+5	5.4E+5	5.4E+5	5.4E+5	2.4E+8	7.6E+5 (C)	7.6E+5
Bromodichloromethane	75274	NA	1,600 (W)	1,600 (W)	ID	2.8E+5	6,400	31,000	31,000	57,000	1.1E+8	4.9E+5	1.5E+6
Bromoform	75252	NA	1,600 (W)	1,600 (W)	ID	8.7E+5 (C)	7.7E+5	3.1E+6	3.1E+6	3.1E+6	3.6E+9	8.7E+5 (C)	8.7E+5
Bromomethane	74839	NA	200	580	700	1.4E+6	1,600	13,000	57,000	1.4E+5	1.5E+8	1.0E+6	2.2E+6
n-Butanol (I)	71363	NA	19,000	54,000	NA	8.7E+6 (C)	NLV	NLV	NLV	NLV	1.0E+10	8.7E+6 (C)	8.7E+6
2-Butanone (MEK) (I)	78933	NA	2.6E+5	7.6E+5	44,000	2.7E+7 (C)	2.7E+7 (C)	3.5E+7	3.5E+7	3.6E+7	2.9E+10	2.7E+7 (C,DD)	2.7E+7
n-Butyl acetate	123864	NA	11,000	32,000	NA	1.1E+6 (C)	1.1E+6 (C)	1.4E+8	3.1E+8	3.5E+8	2.1E+11	1.1E+6 (C)	1.1E+6
t-Butyl alcohol	75650	NA	78,000	2.2E+5	NA	1.1E+8 (C)	1.1E+8 (C)	1.2E+8	2.4E+8	2.4E+8	5.6E+10	1.1E+8 (C)	1.1E+8
Butyl benzyl phthalate	85687	NA	3.1E+5 (C)	3.1E+5 (C)	1.2E+5 (X)	3.1E+5 (C)	NLV	NLV	NLV	NLV	2.1E+10	3.1E+5 (C)	3.1E+5
n-Butylbenzene	104518	NA	1,600	4,600	ID	1.2E+5	ID	ID	ID	ID	8.8E+8	8.0E+6	1.0E+7
sec-Butylbenzene	135988	NA	1,600	4,600	ID	88,000	ID	ID	ID	ID	1.8E+8	8.0E+6	1.0E+7
t-Butylbenzene (I)	98066	NA	1,600	4,600	ID	1.8E+5	ID	ID	ID	ID	2.9E+8	8.0E+6	1.0E+7
Cadmium (B)	7440439	1,200	6,000	6,000	(G,X)	2.3E+8	NLV	NLV	NLV	NLV	2.2E+6	2.1E+6	NA
Camphene (I)	79925	NA	ID	ID	NA	ID	6,700	1.8E+5	9.1E+5	2.2E+6	2.4E+9	ID	NA
Caprolactam	105602	NA	1.2E+5	3.4E+5	NA	1.0E+9 (D)	NLV	NLV	NLV	NLV	2.9E+8	3.1E+8 (DD)	NA
Carbaryl	63252	NA	14,000	40,000	NA	2.6E+6	ID	ID	ID	ID	ID	7.0E+7	NA
Carbazole	86748	NA	9,400	39,000	1,100	8.2E+5	NLV	NLV	NLV	NLV	7.8E+7	2.4E+6	NA
Carbofuran	1563662	NA	800	800	NA	6.8E+6	NLV	NLV	NLV	NLV	ID	3.6E+6	NA

Attachment 1
TABLE 3. SOIL: NONRESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per kilogram (ug/kg). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic soil criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value. Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

			Groundwater Protection				Indoor Air	Ambient Air (Y)				Direct Contact	
Guidesheet Number ——>		#10	#11	#21	#12	#13	#22	#23	#24	#25	#26	#27	#20
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Residential Drinking Water Protection Criteria & RBSLs	Non-Residential Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
Carbon disulfide (I,R)	75150	NA	16,000	46,000	ID	2.8E+5 (C)	1.4E+5	1.6E+6	8.0E+6	1.9E+7	2.1E+10	2.8E+5 (C,DD)	2.8E+5
Carbon tetrachloride	56235	NA	100	100	900 (X)	92,000	990	12,000	34,000	79,000	1.7E+8	3.9E+5 (C)	3.9E+5
Chlordane (J)	57749	NA	NLL	NLL	NLL	NLL	5.9E+7	4.2E+6	4.2E+6	4.2E+6	2.1E+7	1.5E+5	NA
Chloride	16887006	NA	5.0E+6	5.0E+6	(X)	ID	NLV	NLV	NLV	NLV	ID	5.0E+5 (F)	NA
Chlorobenzene (I)	108907	NA	2,000	2,000	500	2.6E+5 (C)	2.2E+5	9.2E+5	1.1E+6	2.1E+6	2.1E+9	2.6E+5 (C)	2.6E+5
p-Chlorobenzene sulfonic acid	98668	NA	1.5E+5	4.2E+5	ID	NA	ID	ID	ID	ID	ID	7.3E+8	ID
1-Chloro-1,1-difluoroethane	75683	NA	3.0E+5	8.8E+5	NA	9.6E+5 (C)	9.6E+5 (C)	9.4E+7	5.7E+8	1.4E+9	1.5E+12	9.6E+5 (C)	9.6E+5
Chloroethane	75003	NA	8,600	34,000	22,000 (X)	9.5E+5 (C)	9.5E+5 (C)	3.6E+7	1.2E+8	2.8E+8	2.9E+11	9.5E+5 (C)	9.5E+5
2-Chloroethyl vinyl ether	110758	NA	ID	ID	NA	ID	ID	ID	ID	ID	ID	ID	1.9E+6
Chloroform	67663	NA	1,600 (W)	1,600 (W)	7,000	1.5E+6 (C)	38,000	1.5E+5	3.4E+5	7.9E+5	1.6E+9	1.5E+6 (C)	1.5E+6
Chloromethane (I)	74873	NA	5,200	22,000	ID	1.1E+6 (C)	10,000	1.2E+5	1.0E+6	2.5E+6	2.6E+9	1.1E+6 (C)	1.1E+6
4-Chloro-3-methylphenol	59507	NA	5,800	16,000	280	3.0E+6	NLV	NLV	NLV	NLV	ID	1.5E+7	NA
beta-Chloronaphthalene	91587	NA	6.2E+5	1.8E+6	NA	2.3E+6	ID	ID	ID	ID	ID	1.8E+8	NA
2-Chlorophenol	95578	NA	900	2,600	360	1.9E+6	8.0E+5	1.1E+6	1.1E+6	1.1E+6	5.3E+8	4.5E+6	1.9E+7
o-Chlorotoluene (I)	95498	NA	3,300	9,300	ID	5.0E+5 (C)	5.0E+5 (C)	1.5E+6	3.1E+6	6.4E+6	2.1E+9	5.0E+5 (C)	5.0E+5
Chlorpyrifos	2921882	NA	17,000	48,000	1,500	8.4E+5	240	5,500	23,000	56,000	5.9E+7	3.4E+7	NA
Chromium (III) (B,H)	16065831	18,000 (total)	1.0E+9 (D)	1.0E+9 (D)	(G,X)	1.0E+9 (D)	NLV	NLV	NLV	NLV	1.5E+8	1.0E+9 (D)	NA
Chromium (VI)	18540299	NA	30,000	30,000	3,300	1.4E+8	NLV	NLV	NLV	NLV	2.4E+5	9.2E+6	NA
Chrysene (Q)	218019	NA	NLL	NLL	NLL	NLL	ID	ID	ID	ID	ID	8.0E+6	NA
Cobalt	7440484	6,800	800	2,000	2,000	4.8E+7	NLV	NLV	NLV	NLV	5.9E+6	9.0E+6	NA
Copper (B)	7440508	32,000	5.8E+6	5.8E+6	(G)	1.0E+9 (D)	NLV	NLV	NLV	NLV	5.9E+7	7.3E+7	NA

Attachment 1
TABLE 3. SOIL: NONRESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per kilogram (ug/kg). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic soil criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value. Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

			Groundwater Protection				Indoor Air	Ambient Air (Y)				Direct Contact	
Guidesheet Number ——>		#10	#11	#21	#12	#13	#22	#23	#24	#25	#26	#27	#20
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Residential Drinking Water Protection Criteria & RBSLs	Non-Residential Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
Cyanazine	21725462	NA	200	200	1,100 (X)	56,000	NLV	NLV	NLV	NLV	ID	66,000	NA
Cyanide (P,R)	57125	390 (total)	4,000	4,000	100	2.5E+5	NLV	NLV	NLV	NLV	2.5E+5	2.5E+5	NA
Cyclohexanone	108941	NA	5.2E+6	1.5E+7	NA	2.2E+8 (C)	32,000	1.3E+6	1.1E+7	2.7E+7	2.9E+10	2.2E+8 (C)	2.2E+8
Dacthal	1861321	NA	50,000	1.4E+5	NA	3.4E+5	NLV	NLV	NLV	NLV	ID	7.3E+6	NA
Dalapon	75990	NA	4,000	4,000	NA	5.9E+7 (C)	NLV	NLV	NLV	NLV	ID	5.9E+7 (C)	5.9E+7
4-4'-DDD	72548	NA	NLL	NLL	NLL	NLL	NLV	NLV	NLV	NLV	5.6E+7	4.0E+5	NA
4-4'-DDE	72559	NA	NLL	NLL	NLL	NLL	NLV	NLV	NLV	NLV	4.0E+7	1.9E+5	NA
4-4'-DDT	50293	NA	NLL	NLL	NLL	NLL	NLV	NLV	NLV	NLV	4.0E+7	2.8E+5	NA
Decabromodiphenyl ether	1163195	NA	1.4E+5	1.4E+5	NA	1.4E+5	1.0E+9 (D)	1.0E+8	1.0E+8	1.0E+8	1.0E+9	1.1E+7	NA
Di-n-butyl phthalate	84742	NA	7.6E+5 (C)	7.6E+5 (C)	11,000	7.6E+5 (C)	NLV	NLV	NLV	NLV	1.5E+9	7.6E+5 (C)	7.6E+5
Di(2-ethylhexyl) adipate	103231	NA	9.6E+5 (C)	9.6E+5 (C)	ID	9.6E+5 (C)	NLV	NLV	NLV	NLV	1.2E+10	9.6E+5 (C,DD)	9.6E+5
Di-n-octyl phthalate	117840	NA	1.0E+8	1.4E+8 (C)	ID	1.4E+8 (C)	NLV	NLV	NLV	NLV	1.4E+10	2.0E+7	1.4E+8
Diacetone alcohol (I)	123422	NA	ID	ID	NA	ID	NLV	NLV	NLV	NLV	7.1E+10	ID	1.1E+8
Diazinon	333415	NA	95	280	72	95,000	NLV	NLV	NLV	NLV	ID	70,000 (DD)	3.1E+5
Dibenzo(a,h)anthracene (Q)	53703	NA	NLL	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	8,000	NA
Dibenzofuran	132649	NA	ID	ID	1,700	ID	3.6E+6	1.6E+5	1.6E+5	1.6E+5	2.9E+6	ID	NA
Dibromochloromethane	124481	NA	1,600 (W)	1,600 (W)	ID	3.6E+5	21,000	80,000	80,000	98,000	1.6E+8	5.0E+5	6.1E+5
Dibromochloropropane	96128	NA	10 (M); 4.0	10 (M); 4.0	ID	1,200 (C)	1,200 (C)	15,000	15,000	15,000	5.9E+6	1,200 (C)	1,200
Dibromomethane	74953	NA	1,600	4,600	NA	2.0E+6 (C)	ID	ID	ID	ID	ID	2.0E+6 (C)	2.0E+6
Dicamba	1918009	NA	4,400	13,000	NA	1.2E+7	NLV	NLV	NLV	NLV	ID	1.7E+7	NA
1,2-Dichlorobenzene	95501	NA	14,000	14,000	280	2.1E+5 (C)	2.1E+5 (C)	4.6E+7	4.6E+7	5.5E+7	4.4E+10	2.1E+5 (C)	2.1E+5

Attachment 1
TABLE 3. SOIL: NONRESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per kilogram (ug/kg). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic soil criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value. Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

			Groundwater Protection				Indoor Air	Ambient Air (Y)				Direct Contact	
Guidesheet Number ——>		#10	#11	#21	#12	#13	#22	#23	#24	#25	#26	#27	#20
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Residential Drinking Water Protection Criteria & RBSLs	Non-Residential Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
1,3-Dichlorobenzene	541731	NA	170	480	680	51,000	48,000	94,000	94,000	1.1E+5	8.8E+7	1.7E+5 (C)	1.7E+5
1,4-Dichlorobenzene	106467	NA	1,700	1,700	360	1.4E+5	1.0E+5	2.6E+5	2.6E+5	3.4E+5	5.7E+8	1.9E+6	NA
3,3'-Dichlorobenzidine	91941	NA	2,000 (M); 28	2,000 (M); 110	2,000 (M); 7.4	4,600	NLV	NLV	NLV	NLV	8.2E+6	30,000	NA
Dichlorodifluoromethane	75718	NA	95,000	2.7E+5	ID	1.0E+6 (C)	1.7E+6	6.3E+7	5.5E+8	1.4E+9	1.5E+12	1.0E+6 (C)	1.0E+6
1,1-Dichloroethane	75343	NA	18,000	50,000	15,000	8.9E+5 (C)	4.3E+5	2.5E+6	6.0E+6	1.4E+7	1.5E+10	8.9E+5 (C)	8.9E+5
1,2-Dichloroethane (I)	107062	NA	100	100	7,200 (X)	3.8E+5	11,000	21,000	33,000	74,000	1.5E+8	4.2E+5	1.2E+6
1,1-Dichloroethylene (I)	75354	NA	140	140	2,600	2.2E+5	330	3,700	15,000	37,000	7.8E+7	5.7E+5 (C)	5.7E+5
cis-1,2-Dichloroethylene	156592	NA	1,400	1,400	12,000	6.4E+5 (C)	41,000	2.1E+5	4.3E+5	1.0E+6	1.0E+9	6.4E+5 (C)	6.4E+5
trans-1,2-Dichloroethylene	156605	NA	2,000	2,000	30,000 (X)	1.4E+6 (C)	43,000	3.3E+5	8.4E+5	2.0E+6	2.1E+9	1.4E+6 (C)	1.4E+6
2,6-Dichloro-4-nitroaniline	99309	NA	44,000	1.3E+5	NA	1.4E+5	NLV	NLV	NLV	NLV	ID	2.2E+8	NA
2,4-Dichlorophenol	120832	NA	1,500	4,200	330 (M); 220	9.6E+5	NLV	NLV	NLV	NLV	2.3E+9	1.8E+6 (C,DD)	1.8E+6
2,4-Dichlorophenoxyacetic acid	94757	NA	1,400	1,400	4,400	2.4E+6	NLV	NLV	NLV	NLV	2.9E+9	8.6E+6	NA
1,2-Dichloropropane (I)	78875	NA	100	100	4,600 (X)	3.2E+5	7,400	30,000	51,000	1.2E+5	1.2E+8	5.5E+5 (C)	5.5E+5
1,3-Dichloropropene	542756	NA	170	700	180 (X)	1.1E+5	5,400	60,000	2.0E+5	4.7E+5	5.9E+8	2.4E+5	6.2E+5
Dichlorovos	62737	NA	50 (M); 32	130	NA	1.2E+5	NLV	NLV	NLV	NLV	1.5E+7	47,000	2.2E+6
Dicyclohexyl phthalate	84617	NA	ID	ID	NA	ID	ID	ID	ID	ID	ID	ID	NA
Dieldrin	60571	NA	NLL	NLL	NLL	NLL	7.2E+5	64,000	64,000	64,000	8.5E+5	4,700	NA
Diethyl ether	60297	NA	200	200	ID	7.4E+6 (C)	7.4E+6 (C)	1.0E+8	1.6E+8	3.5E+8	3.5E+11	7.4E+6 (C)	7.4E+6
Diethyl phthalate	84662	NA	1.1E+5	3.2E+5	2,200	7.4E+5 (C)	NLV	NLV	NLV	NLV	1.5E+9	7.4E+5 (C)	7.4E+5
Diethylene glycol monobutyl ether	112345	NA	1,800	5,000	NA	8.0E+7	NLV	NLV	NLV	NLV	5.9E+8	8.7E+6	1.1E+8
Diisopropyl ether	108203	NA	600	1,300 (C)	ID	1,300 (C)	1,300 (C)	3.2E+6	4.8E+6	1.0E+7	1.1E+10	1,300 (C)	1,300

Attachment 1
TABLE 3. SOIL: NONRESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per kilogram (ug/kg). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic soil criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value. Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

			Groundwater Protection				Indoor Air	Ambient Air (Y)				Direct Contact	
Guidesheet Number ——>		#10	#11	#21	#12	#13	#22	#23	#24	#25	#26	#27	#20
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Residential Drinking Water Protection Criteria & RBSLs	Non-Residential Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
Diisopropylamine (I)	108189	NA	110	320	NA	4.2E+5	6.7E+6 (C)	7.4E+6	7.4E+6	7.7E+6	5.9E+9	5.6E+5	6.7E+6
Dimethyl phthalate	131113	NA	7.9E+5 (C)	7.9E+5 (C)	NA	7.9E+5 (C)	NLV	NLV	NLV	NLV	1.5E+9	7.9E+5 (C)	7.9E+5
N,N-Dimethylacetamide	127195	NA	3,600	10,000	82,000 (X)	1.1E+8 (C)	NLV	NLV	NLV	NLV	ID	1.8E+7	1.1E+8
N,N-Dimethylaniline	121697	NA	320	920	NA	4.0E+5	8.0E+5 (C)	5.2E+5	5.2E+5	5.2E+5	3.3E+8	8.0E+5 (C)	8.0E+5
Dimethylformamide (I)	68122	NA	14,000	40,000	NA	1.1E+8 (C)	NLV	NLV	NLV	NLV	8.8E+8	7.0E+7	1.1E+8
2,4-Dimethylphenol	105679	NA	7,400	20,000	7,600	1.0E+7	NLV	NLV	NLV	NLV	2.1E+9	3.6E+7	NA
2,6-Dimethylphenol	576261	NA	330 (M); 88	330 (M); 260	NA	1.3E+5	NLV	NLV	NLV	NLV	5.9E+7	4.4E+5	NA
3,4-Dimethylphenol	95658	NA	330 (M); 200	580	NA	3.6E+5	NLV	NLV	NLV	NLV	1.0E+8	1.0E+6	NA
Dimethylsulfoxide	67685	NA	4.4E+6	1.3E+7	3.8E+6	1.8E+7 (C)	NLV	NLV	NLV	NLV	5.9E+8	1.8E+7 (C)	1.8E+7
2,4-Dinitrotoluene	121142	NA	430	640	NA	1.7E+5	NLV	NLV	NLV	NLV	2.0E+7	2.2E+5	NA
Dinoseb	88857	NA	300	300	200 (M); 43	1.4E+5 (C)	NLV	NLV	NLV	NLV	1.2E+8	1.4E+5 (C,DD)	1.4E+5
1,4-Dioxane (I)	123911	NA	1,700	7,000	56,000 (X)	3.4E+7	NLV	NLV	NLV	NLV	7.1E+8	2.4E+6	9.7E+7
Diquat	85007	NA	400	400	NA	1.4E+7	NLV	NLV	NLV	NLV	ID	1.6E+6	NA
Diuron	330541	NA	620	1,800	NA	7.4E+5	NLV	NLV	NLV	NLV	2.1E+8	3.1E+6	NA
Endosulfan (J)	115297	NA	NLL	NLL	NLL	NLL	ID	ID	ID	ID	ID	4.4E+6	NA
Endothall	145733	NA	NLL	NLL	NLL	NLL	NLV	NLV	NLV	NLV	1.0E+9	1.2E+7	NA
Endrin	72208	NA	NLL	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	1.9E+5	NA
Epichlorohydrin (I)	106898	NA	100	100	NA	2.2E+5	1.2E+5	37,000	37,000	37,000	2.9E+7	41,000	7.3E+6
Ethanol (I)	64175	NA	3.8E+7	7.6E+7	ID	1.1E+8 (C)	NLV	NLV	NLV	NLV	5.6E+11	1.1E+8 (C,DD)	1.1E+8
Ethyl acetate (I)	141786	NA	1.3E+5	3.8E+5	NA	7.5E+6 (C)	7.5E+6 (C)	5.9E+7	5.9E+7	1.0E+8	9.4E+10	7.5E+6 (C)	7.5E+6
Ethyl-tert-butyl ether (ETBE)	637923	NA	980	980	ID	ID	6.5E+5 (C)	2.3E+6	4.6E+6	1.1E+7	1.1E+10	ID	6.5E+5

Attachment 1
TABLE 3. SOIL: NONRESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per kilogram (ug/kg). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic soil criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value. Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

			Groundwater Protection				Indoor Air	Ambient Air (Y)				Direct Contact	
Guidesheet Number ——>		#10	#11	#21	#12	#13	#22	#23	#24	#25	#26	#27	#20
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Residential Drinking Water Protection Criteria & RBSLs	Non-Residential Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
Ethylbenzene (I)	100414	NA	1,500	1,500	360	1.4E+5 (C)	1.4E+5 (C)	2.4E+6	3.1E+6	6.5E+6	1.3E+10	1.4E+5 (C)	1.4E+5
Ethylene dibromide	106934	NA	20 (M); 1.0	20 (M); 1.0	110 (X)	500	3,600	5,800	5,800	9,800	1.8E+7	430	8.9E+5
Ethylene glycol	107211	NA	3.0E+5	8.4E+5	3.8E+6 (X)	1.1E+8 (C)	NLV	NLV	NLV	NLV	2.9E+10	1.1E+8 (C)	1.1E+8
Ethylene glycol monobutyl ether	111762	NA	74,000	2.0E+5	NA	4.1E+7 (C)	1.4E+6	2.1E+7	1.5E+8	3.6E+8	3.8E+11	4.1E+7 (C)	4.1E+7
Fluoranthene	206440	NA	7.3E+5	7.3E+5	5,500	7.3E+5	1.0E+9 (D)	8.9E+8	8.8E+8	8.8E+8	4.1E+9	1.3E+8	NA
Fluorene	86737	NA	3.9E+5	8.9E+5	5,300	8.9E+5	1.0E+9 (D)	1.5E+8	1.5E+8	1.5E+8	4.1E+9	8.7E+7	NA
Fluorine (soluble fluoride) (B)	7782414	NA	40,000	40,000	ID	2.4E+8	NLV	NLV	NLV	NLV	ID	6.7E+7 (DD)	NA
Formaldehyde	50000	NA	26,000	76,000	2,400	6.0E+7 (C)	65,000	43,000	69,000	1.5E+5	3.0E+8	6.0E+7 (C)	6.0E+7
Formic acid (I,U)	64186	NA	2.0E+5	5.8E+5	ID	1.1E+8 (C)	2.8E+6	2.6E+5	1.6E+5	1.6E+5	5.9E+7	1.1E+8 (C)	1.1E+8
1-Formylpiperidine	2591868	NA	1,600	4,600	NA	ID	ID	ID	ID	ID	ID	8.0E+6	1.0E+7
Gentian violet	548629	NA	300	1,300	NA	2.0E+7	NLV	NLV	NLV	NLV	ID	4.4E+5	NA
Glyphosate	1071836	NA	NLL	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	5.7E+7 (DD)	NA
Heptachlor	76448	NA	NLL	NLL	NLL	NLL	1.9E+6	2.1E+5	2.1E+5	2.1E+5	3.0E+6	23,000	NA
Heptachlor epoxide	1024573	NA	NLL	NLL	NLL	NLL	NLV	NLV	NLV	NLV	1.5E+6	9,500	NA
n-Heptane	142825	NA	2.4E+5 (C)	2.4E+5 (C)	NA	2.4E+5 (C)	2.4E+5 (C)	2.5E+7	4.5E+7	1.0E+8	1.0E+11	2.4E+5 (C)	2.4E+5
Hexabromobenzene	87821	NA	5,400	5,400	ID	5,400	ID	ID	ID	ID	ID	3.1E+6	NA
Hexachlorobenzene (C-66)	118741	NA	1,800	1,800	350	8,200	2.2E+5	56,000	56,000	56,000	8.5E+6	37,000	NA
Hexachlorobutadiene (C-46)	87683	NA	26,000	72,000	91	3.5E+5 (C)	3.5E+5 (C)	4.6E+5	4.6E+5	4.6E+5	1.8E+8	3.5E+5 (C)	3.5E+5
alpha-Hexachlorocyclohexane	319846	NA	18	71	ID	2,500	1.6E+5	41,000	86,000	86,000	2.1E+6	12,000	NA
beta-Hexachlorocyclohexane	319857	NA	37	150	ID	5,100	NLV	NLV	NLV	NLV	7.4E+6	25,000	NA
Hexachlorocyclopentadiene (C-56)	77474	NA	3.2E+5	3.2E+5	ID	7.2E+5 (C)	56,000	60,000	60,000	60,000	5.9E+6	7.2E+5 (C)	7.2E+5

Attachment 1
TABLE 3. SOIL: NONRESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per kilogram (ug/kg). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic soil criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value. Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

			Groundwater Protection				Indoor Air	Ambient Air (Y)				Direct Contact	
Guidesheet Number ——>		#10	#11	#21	#12	#13	#22	#23	#24	#25	#26	#27	#20
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Residential Drinking Water Protection Criteria & RBSLs	Non-Residential Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
Hexachloroethane	67721	NA	430	1,200	1,800 (X)	1.1E+5	79,000	6.6E+5	1.4E+6	1.4E+6	1.0E+8	7.3E+5	NA
n-Hexane	110543	NA	44,000 (C)	44,000 (C)	NA	44,000 (C)	44,000 (C)	3.5E+6	3.5E+6	6.4E+6	5.9E+9	44,000 (C)	44,000
2-Hexanone	591786	NA	20,000	58,000	ID	2.5E+6 (C)	1.8E+6	1.3E+6	1.3E+6	1.5E+6	1.2E+9	2.5E+6 (C)	2.5E+6
Indeno(1,2,3-cd)pyrene (Q)	193395	NA	NLL	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	80,000	NA
Iron (B)	7439896	1.2E+7	6,000	6,000	NA	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	5.8E+8	NA
Isobutyl alcohol (I)	78831	NA	46,000	1.3E+5	NA	8.9E+6 (C)	8.9E+6 (C)	9.5E+7	9.5E+7	9.5E+7	4.4E+10	8.9E+6 (C)	8.9E+6
Isophorone	78591	NA	15,000	62,000	26,000 (X)	2.4E+6 (C)	NLV	NLV	NLV	NLV	8.2E+9	2.4E+6 (C)	2.4E+6
Isopropyl alcohol (I)	67630	NA	9,400	26,000	1.1E+6 (X)	1.1E+8 (C)	NLV	NLV	NLV	NLV	6.5E+9	4.7E+7	1.1E+8
Isopropyl benzene	98828	NA	91,000	2.6E+5	3,200	3.9E+5 (C)	3.9E+5 (C)	2.0E+6	2.0E+6	3.0E+6	2.6E+9	3.9E+5 (C)	3.9E+5
Lead (B)	7439921	21,000	7.0E+5	7.0E+5	(G,X)	ID	NLV	NLV	NLV	NLV	4.4E+7	9.0E+5 (DD)	NA
Lindane	58899	NA	20 (M); 7.0	20 (M); 7.0	20 (M); 1.1	7,100	ID	ID	ID	ID	ID	42,000	NA
Lithium (B)	7439932	9,800	3,400	7,000	8,800	1.1E+8	NLV	NLV	NLV	NLV	ID	3.1E+7 (DD)	NA
Magnesium (B)	7439954	NA	8.0E+6	2.2E+7	NA	1.0E+9 (D)	NLV	NLV	NLV	NLV	2.9E+9	1.0E+9 (D)	NA
Manganese (B)	7439965	4.4E+5	1,000	1,000	(G,X)	1.8E+8	NLV	NLV	NLV	NLV	1.5E+6	9.0E+7	NA
Mercury (Total) (B,Z)	Varies	130	1,700	1,700	50 (M); 1.2	47,000	89,000	62,000	62,000	62,000	8.8E+6	5.8E+5	NA
Methane	74828	NA	ID	ID	NA	ID	8.4E+6 ug/m3 (GG)	ID	ID	ID	ID	ID	ID
Methanol	67561	NA	74,000	2.0E+5	3.1E+6 (C)	3.1E+6 (C)	3.1E+6 (C)	3.7E+7	4.6E+7	9.7E+7	9.6E+10	3.1E+6 (C)	3.1E+6
Methoxychlor	72435	NA	16,000	16,000	NA	18,000	ID	ID	ID	ID	ID	5.6E+6	NA
2-Methoxyethanol (I)	109864	NA	150	420	NA	1.7E+7	NLV	NLV	NLV	NLV	5.9E+8	7.3E+5	1.1E+8
2-Methyl-4-chlorophenoxyacetic acid	94746	NA	390	1,100	NA	4.9E+5	NLV	NLV	NLV	NLV	ID	7.3E+5	NA
2-Methyl-4,6-dinitrophenol	534521	NA	830 (M); 400	830 (M); 400	NA	1.9E+5	NLV	NLV	NLV	NLV	ID	2.6E+5	NA

Attachment 1
TABLE 3. SOIL: NONRESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per kilogram (ug/kg). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic soil criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value. Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

			Groundwater Protection				Indoor Air	Ambient Air (Y)				Direct Contact	
Guidesheet Number ——>		#10	#11	#21	#12	#13	#22	#23	#24	#25	#26	#27	#20
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Residential Drinking Water Protection Criteria & RBSLs	Non-Residential Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
N-Methyl-morpholine (I)	109024	NA	400	1,100	NA	3.0E+7	NLV	NLV	NLV	NLV	ID	2.0E+6	1.1E+8
Methyl parathion	298000	NA	46	130	NA	76,000	NLV	NLV	NLV	NLV	ID	1.8E+5	NA
4-Methyl-2-pentanone (MIBK) (I)	108101	NA	36,000	1.0E+5	ID	2.7E+6 (C)	2.7E+6 (C)	5.3E+7	5.3E+7	7.0E+7	6.0E+10	2.7E+6 (C)	2.7E+6
Methyl-tert-butyl ether (MTBE)	1634044	NA	800	800	1.4E+5 (X)	5.9E+6 (C)	5.9E+6 (C)	3.0E+7	4.1E+7	8.9E+7	8.8E+10	5.9E+6 (C)	5.9E+6
Methylcyclopentane (I)	96377	NA	ID	ID	NA	ID	1.7E+5	2.8E+6	8.3E+6	2.0E+7	2.1E+10	ID	3.5E+5
4,4'-Methylene-bis-2- chloroaniline (MBOCA)	101144	NA	NLL	NLL	NLL	NLL	NLV	NLV	NLV	NLV	1.1E+8	32,000	NA
Methylene chloride	75092	NA	100	100	30,000 (X)	2.3E+6 (C)	2.4E+5	7.0E+5	1.7E+6	4.0E+6	8.3E+9	2.3E+6 (C)	2.3E+6
2-Methylnaphthalene	91576	NA	57,000	1.7E+5	4,200	5.5E+6	4.9E+6	1.8E+6	1.8E+6	1.8E+6	2.9E+8	2.6E+7	NA
Methylphenols (J)	1319773	NA	7,400	20,000	1,000 (M); 600	1.6E+7	NLV	NLV	NLV	NLV	2.9E+9	3.6E+7	NA
Metolachlor	51218452	NA	4,800	20,000	300	4.4E+5 (C)	NLV	NLV	NLV	NLV	ID	4.4E+5 (C,DD)	4.4E+5
Metribuzin	21087649	NA	3,600	10,000	NA	2.4E+7	ID	ID	ID	ID	ID	2.8E+7	NA
Mirex	2385855	NA	NLL	NLL	NLL	NLL	ID	ID	ID	ID	ID	40,000	NA
Molybdenum (B)	7439987	NA	1,500	4,200	64,000 (X)	1.9E+7	NLV	NLV	NLV	NLV	ID	9.6E+6	NA
Naphthalene	91203	NA	35,000	1.0E+5	730	2.1E+6	4.7E+5	3.5E+5	3.5E+5	3.5E+5	8.8E+7	5.2E+7	NA
Nickel (B)	7440020	20,000	1.0E+5	1.0E+5	(G)	1.0E+9 (D)	NLV	NLV	NLV	NLV	1.6E+7	1.5E+8	NA
Nitrate (B,N)	14797558	NA	2.0E+5 (N)	2.0E+5 (N)	ID	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	ID	NA
Nitrite (B,N)	14797650	NA	20,000 (N)	20,000 (N)	NA	3.8E+8	NLV	NLV	NLV	NLV	ID	ID	NA
Nitrobenzene (I)	98953	NA	330 (M); 68	330 (M); 190	3,600 (X)	2.2E+5	1.7E+5	64,000	64,000	64,000	2.1E+7	3.4E+5	4.9E+5
2-Nitrophenol	88755	NA	400	1,200	ID	1.6E+6	NLV	NLV	NLV	NLV	ID	2.0E+6	NA
n-Nitroso-di-n-propylamine	621647	NA	330 (M); 100	330 (M); 100	NA	7,200	NLV	NLV	NLV	NLV	2.0E+6	5,400	1.5E+6
N-Nitrosodiphenylamine	86306	NA	5,400	22,000	NA	7.0E+5	NLV	NLV	NLV	NLV	2.8E+9	7.8E+6	NA

Attachment 1
TABLE 3. SOIL: NONRESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per kilogram (ug/kg). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic soil criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value. Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

			Groundwater Protection				Indoor Air	Ambient Air (Y)				Direct Contact	
Guidesheet Number —>		#10	#11	#21	#12	#13	#22	#23	#24	#25	#26	#27	#20
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Residential Drinking Water Protection Criteria & RBSLs	Non-Residential Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
Oxamyl	23135220	NA	4,000	4,000	NA	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	2.8E+7	NA
Oxo-hexyl acetate	88230357	NA	1,500	4,200	NA	ID	ID	ID	ID	ID	2.4E+9	7.3E+6	1.0E+7
Pendimethalin	40487421	NA	1.1E+6	1.1E+6	NA	1.1E+6	NLV	NLV	NLV	NLV	ID	1.3E+8	NA
Pentachlorobenzene	608935	NA	29,000	81,000	9,500	1.9E+5 (C)	ID	ID	ID	ID	ID	1.9E+5 (C)	1.9E+5
Pentachloronitrobenzene	82688	NA	37,000	37,000	NA	37,000	2.2E+5	2.8E+5	2.8E+5	2.8E+5	1.5E+8	5.5E+6	NA
Pentachlorophenol	87865	NA	22	22	(G,X)	4,300	NLV	NLV	NLV	NLV	1.3E+8	3.2E+5	NA
Pentane	109660	NA	ID	ID	NA	ID	1.8E+5	4.4E+7	3.4E+8	6.0E+8	5.3E+11	ID	2.4E+5
2-Pentene (I)	109682	NA	ID	ID	NA	ID	ID	ID	ID	ID	ID	ID	2.2E+5
Phenanthrene	85018	NA	56,000	1.6E+5	2,100	1.1E+6	5.1E+6	1.9E+5	1.9E+5	1.9E+5	2.9E+6	5.2E+6	NA
Phenol	108952	NA	88,000	2.6E+5	9,000	1.2E+7 (C)	NLV	NLV	NLV	NLV	1.8E+10	1.2E+7 (C,DD)	1.2E+7
Phosphorus (Total)	7723140	NA	1.3E+6	4.8E+6	(EE)	ID	NLV	NLV	NLV	NLV	2.9E+7	1.0E+9 (D)	NA
Phthalic acid	88993	NA	2.8E+5	8.0E+5	NA	1.7E+6 (C)	NLV	NLV	NLV	NLV	ID	1.7E+6 (C)	1.7E+6
Phthalic anhydride	85449	NA	3.0E+5	8.8E+5	NA	1.1E+6 (C)	NLV	NLV	NLV	NLV	ID	1.1E+6 (C)	1.1E+6
Picloram	1918021	NA	10,000	10,000	920	8.6E+6	NLV	NLV	NLV	NLV	ID	5.1E+7	NA
Piperidine	110894	NA	64	180	NA	6.8E+5	NLV	NLV	NLV	NLV	4.1E+9	3.2E+5	1.2E+8
Polybrominated biphenyls (J)	67774327	NA	NLL	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	4,800	NA
Polychlorinated biphenyls (PCBs) (J,T)	1336363	NA	NLL	NLL	NLL	NLL	1.6E+7	8.1E+5	2.8E+7	2.8E+7	6.5E+6	(T)	NA
Prometon	1610180	NA	4,900	14,000	NA	5.5E+6	NLV	NLV	NLV	NLV	ID	1.6E+7	NA
Propachlor	1918167	NA	1,900	5,400	NA	8.8E+6	NLV	NLV	NLV	NLV	ID	9.5E+6	NA
Propazine	139402	NA	4,000	11,000	NA	1.7E+5	NLV	NLV	NLV	NLV	ID	2.0E+7	NA
Propionic acid	79094	NA	2.4E+5	7.0E+5	ID	1.1E+8 (C)	NLV	NLV	NLV	NLV	8.8E+9	1.1E+8 (C)	1.1E+8

Attachment 1
TABLE 3. SOIL: NONRESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per kilogram (ug/kg). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic soil criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value. Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

			Groundwater Protection				Indoor Air	Ambient Air (Y)				Direct Contact	
Guidesheet Number ——>		#10	#11	#21	#12	#13	#22	#23	#24	#25	#26	#27	#20
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Residential Drinking Water Protection Criteria & RBSLs	Non-Residential Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
Propyl alcohol (I)	71238	NA	28,000	80,000	NA	1.1E+8 (C)	NLV	NLV	NLV	NLV	2.1E+10	7.4E+7 (DD)	1.1E+8
n-Propylbenzene (I)	103651	NA	1,600	4,600	ID	3.0E+5	ID	ID	ID	ID	5.9E+8	8.0E+6	1.0E+7
Propylene glycol	57556	NA	3.0E+6	8.4E+6	5.8E+6	1.1E+8 (C)	NLV	NLV	NLV	NLV	1.8E+11	1.1E+8 (C)	1.1E+8
Pyrene	129000	NA	4.8E+5	4.8E+5	ID	4.8E+5	1.0E+9 (D)	7.8E+8	7.8E+8	7.8E+8	2.9E+9	8.4E+7	NA
Pyridine (I)	110861	NA	400	420	NA	37,000 (C)	2,000	9,800	40,000	97,000	1.0E+8	37,000 (C)	37,000
Selenium (B)	7782492	410	4,000	4,000	400	7.8E+7	NLV	NLV	NLV	NLV	5.9E+7	9.6E+6	NA
Silver (B)	7440224	1,000	4,500	13,000	100 (M); 27	2.0E+8	NLV	NLV	NLV	NLV	2.9E+6	9.0E+6	NA
Silvex (2,4,5-TP)	93721	NA	3,600	3,600	2,200	3.1E+6	NLV	NLV	NLV	NLV	ID	5.5E+6	NA
Simazine	122349	NA	80	80	340	90,000	NLV	NLV	NLV	NLV	ID	3.8E+6	NA
Sodium	17341252	NA	2.5E+6	7.0E+6	NA	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	1.0E+9 (D)	NA
Sodium azide	26628228	NA	1,800	5,000	1,000	ID	ID	ID	ID	ID	ID	8.7E+6	NA
Strontium (B)	7440246	NA	92,000	2.6E+5	4.2E+5	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	1.0E+9 (D)	NA
Styrene	100425	NA	2,700	2,700	2,100 (X)	2.7E+5	5.2E+5 (C)	3.3E+6	3.3E+6	4.2E+6	6.9E+9	5.2E+5 (C)	5.2E+5
Sulfate	14808798	NA	5.0E+6	5.0E+6	NA	ID	NLV	NLV	NLV	NLV	ID	ID	NA
Tebuthiuron	34014181	NA	10,000	30,000	NA	5.0E+7	NLV	NLV	NLV	NLV	ID	2.7E+7 (DD)	NA
2,3,7,8-Tetrabromodibenzo-p-dioxin (O)	50585416	NA	NLL	NLL	NLL	NLL	NLV	NLV	NLV	NLV	(O)	(O)	NA
1,2,4,5-Tetrachlorobenzene	95943	NA	1.5E+6	1.5E+6	3,400 (X)	1.5E+6	1.1E+6	2.7E+5	2.7E+5	2.7E+5	2.9E+7	2.5E+8	NA
2,3,7,8-Tetrachlorodibenzo-p-dioxin (O)	1746016	NA	NLL	NLL	NLL	NLL	NLV	NLV	NLV	NLV	89 (O)	0.99 (O)	NA
1,1,1,2-Tetrachloroethane	630206	NA	1,500	6,400	ID	4.4E+5 (C)	33,000	1.2E+5	2.1E+5	3.3E+5	5.3E+8	4.4E+5 (C)	4.4E+5
1,1,2,2-Tetrachloroethane	79345	NA	170	700	1,600 (X)	94,000	23,000	34,000	34,000	34,000	6.8E+7	2.4E+5	8.7E+5
Tetrachloroethylene	127184	NA	100	100	1,200 (X)	88,000 (C)	60,000	6.0E+5	1.4E+6	3.3E+6	6.8E+9	88,000 (C)	88,000

Attachment 1
TABLE 3. SOIL: NONRESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per kilogram (ug/kg). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic soil criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value. Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

			Groundwater Protection				Indoor Air	Ambient Air (Y)				Direct Contact	
Guidesheet Number ——>		#10	#11	#21	#12	#13	#22	#23	#24	#25	#26	#27	#20
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Residential Drinking Water Protection Criteria & RBSLs	Non-Residential Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
Tetrahydrofuran	109999	NA	1,900	5,400	2.2E+5 (X)	3.2E+7	2.4E+6	1.5E+7	6.7E+7	1.6E+8	1.7E+11	9.5E+6	1.2E+8
Tetranitromethane	509148	NA	ID	ID	NA	ID	600	500 (M); 180	ID	ID	2.6E+5	ID	ID
Thallium (B)	7440280	NA	2,300	2,300	4,200 (X)	1.5E+7	NLV	NLV	NLV	NLV	5.9E+6	1.3E+5	NA
Toluene (I)	108883	NA	16,000	16,000	5,400	2.5E+5 (C)	2.5E+5 (C)	3.3E+6	3.6E+7	3.6E+7	1.2E+10	2.5E+5 (C)	2.5E+5
p-Toluidine	106490	NA	660 (M); 300	1,200	NA	4.8E+5	NLV	NLV	NLV	NLV	1.3E+8	4.3E+5	1.2E+6
Toxaphene	8001352	NA	24,000	24,000	8,200	3.6E+5	NLV	NLV	NLV	NLV	1.2E+7	85,000	NA
Triallate	2303175	NA	95,000	2.5E+5 (C)	NA	2.5E+5 (C)	ID	ID	ID	ID	ID	2.5E+5 (C)	2.5E+5
Tributylamine	102829	NA	7,800	23,000	ID	1.8E+6	1.1E+6	7.2E+5	7.2E+5	7.2E+5	2.1E+8	2.6E+6	3.7E+6
1,2,4-Trichlorobenzene	120821	NA	4,200	4,200	5,900 (X)	1.1E+6 (C)	1.1E+6 (C)	3.4E+7	3.4E+7	3.4E+7	1.1E+10	1.1E+6 (C,DD)	1.1E+6
1,1,1-Trichloroethane	71556	NA	4,000	4,000	1,800	4.6E+5 (C)	4.6E+5	4.5E+6	1.5E+7	3.1E+7	2.9E+10	4.6E+5 (C)	4.6E+5
1,1,2-Trichloroethane	79005	NA	100	100	6,600 (X)	4.2E+5	24,000	57,000	57,000	1.2E+5	2.5E+8	8.4E+5	9.2E+5
Trichloroethylene	79016	NA	100	100	4,000 (X)	4.4E+5	37,000	2.6E+5	4.4E+5	1.1E+6	2.3E+9	5.0E+5 (C,DD)	5.0E+5
Trichlorofluoromethane	75694	NA	52,000	1.5E+5	NA	5.6E+5 (C)	5.6E+5 (C)	1.1E+8	1.4E+11	1.4E+11	1.7E+12	5.6E+5 (C)	5.6E+5
2,4,5-Trichlorophenol	95954	NA	39,000	1.1E+5	NA	9.1E+6	NLV	NLV	NLV	NLV	1.0E+10	7.3E+7	NA
2,4,6-Trichlorophenol	88062	NA	2,400	9,400	330 (M); 100	2.0E+5	NLV	NLV	NLV	NLV	1.3E+9	3.3E+6	NA
1,2,3-Trichloropropane	96184	NA	840	2,400	NA	8.3E+5 (C)	7,500	11,000	11,000	12,000	8.8E+6	8.3E+5 (C)	8.3E+5
1,1,2-Trichloro-1,2,2-trifluoroethane	76131	NA	5.5E+5 (C)	5.5E+5 (C)	1,700	5.5E+5 (C)	5.5E+5 (C)	2.1E+8	8.9E+8	2.1E+9	2.3E+12	5.5E+5 (C)	5.5E+5
Triethanolamine	102716	NA	74,000	2.0E+5	NA	1.1E+8 (C)	NLV	NLV	NLV	NLV	1.5E+9	1.1E+8 (C)	1.1E+8
Triethylene glycol	112276	NA	1.1E+5 (C)	1.1E+5 (C)	NA	1.1E+5 (C)	NLV	NLV	NLV	NLV	ID	1.1E+5 (C,DD)	1.1E+5
3-Trifluoromethyl-4-nitrophenol	88302	NA	1.1E+5	3.1E+5	NA	1.2E+8	NLV	NLV	NLV	NLV	ID	2.4E+8 (DD)	NA
Trifluralin	1582098	NA	1.9E+5	5.7E+5	NA	1.2E+7	ID	ID	ID	ID	ID	5.7E+6	NA

Attachment 1
TABLE 3. SOIL: NONRESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to one microgram per kilogram (ug/kg). Criteria with six or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. The lowest generic soil criterion for a given hazardous substance is presented in a bold box. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (R 299.5707). In these cases, two numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value. Criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. The effective dates of the criteria and screening levels in this table vary. Please contact the Remediation Division Toxicology Unit for additional information.

			Groundwater Protection				Indoor Air	Ambient Air (Y)				Direct Contact	
Guidesheet Number ——>		#10	#11	#21	#12	#13	#22	#23	#24	#25	#26	#27	#20
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Residential Drinking Water Protection Criteria & RBSLs	Non-Residential Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
2,2,4-Trimethyl pentane	540841	NA	ID	ID	NA	ID	19,000 (C)	6.3E+6	4.0E+7	9.6E+7	1.0E+11	ID	19,000
2,4,4-Trimethyl-2-pentene (I)	107404	NA	ID	ID	NA	ID	ID	ID	ID	ID	ID	ID	56,000
1,2,4-Trimethylbenzene (I)	95636	NA	2,100	2,100	570	1.1E+5 (C)	1.1E+5 (C)	2.5E+7	6.0E+8	6.0E+8	3.6E+10	1.1E+5 (C)	1.1E+5
1,3,5-Trimethylbenzene (I)	108678	NA	1,800	1,800	1,100	94,000 (C)	94,000 (C)	1.9E+7	4.6E+8	4.6E+8	3.6E+10	94,000 (C)	94,000
Triphenyl phosphate	115866	NA	1.1E+5 (C)	1.1E+5 (C)	NA	1.1E+5 (C)	NLV	NLV	NLV	NLV	ID	1.1E+5 (C)	1.1E+5
tris(2,3-Dibromopropyl)phosphate	126727	NA	930	930	ID	27,000 (C)	27,000 (C)	60,000	60,000	60,000	7.4E+6	20,000	27,000
Urea	57136	NA	ID	ID	NA	ID	NLV	NLV	NLV	NLV	ID	ID	NA
Vanadium	7440622	NA	72,000	9.9E+5	1.9E+5	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	5.5E+6 (DD)	NA
Vinyl acetate (I)	108054	NA	13,000	36,000	NA	2.4E+6 (C)	1.5E+6	2.0E+6	2.7E+6	5.9E+6	5.9E+9	2.4E+6 (C,DD)	2.4E+6
Vinyl chloride	75014	NA	40	40	260 (X)	20,000	2,800	29,000	1.7E+5	4.2E+5	8.9E+8	34,000	4.9E+5
White phosphorus (R)	12185103	NA	2.2	6.0	NA	58,000	NLV	NLV	NLV	NLV	ID	17,000 (DD)	NA
Xylenes (I)	1330207	NA	5,600	5,600	820	1.5E+5 (C)	1.5E+5 (C)	5.4E+7	6.5E+7	1.3E+8	1.3E+11	1.5E+5 (C)	1.5E+5
Zinc (B)	7440666	47,000	2.4E+6	5.0E+6	(G)	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	6.3E+8	NA

Attachment 1

TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

Developed pursuant to R 299.5752 of the Administrative Rules for Part 201 Environmental Remediation of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Scientific notation is represented by E+ or E- a value, for example 200,000 is presented as 2.0E+5. Units are as indicated in each column heading. The dataset for each hazardous substance requires 22 columns. Review all 22 columns across 2 pages when evaluating data for a specific hazardous substance.

Hazardous Substance	Chemical Abstract Service Number	Oral Reference Dose (RFD)	Oral Slope Factor (SF)	Chronic Inhalation Reference Concentration (RfC)	Inhalation Unit Risk Factor (IURF)	Occupational Short Term Exposure Level (STEL)	Relative Source Contribution for Drinking Water (RSC)	Ingestion Absorption Efficiency (AEi)	Dermal Absorption Efficiency (AEd)	Relative Source Contribution for Soil (RSC)	Log Octanol-Water Partition Coefficient (Log Kow)	Soil Organic Carbon-Water Partition Coefficients for Organic Compounds (Koc)
		mg/Kg-day	$(mg/Kg\text{-}day)^{-1}$	ug/m^3	$(ug/m^3)^{-1}$	ug/m^3	unitless	unitless	unitless	unitless	unitless	L/Kg
Acenaphthene	83329	1.8E-1	NA	2.1E+2	NA	NA	0.2	1.0	0.1	1.0	3.92	7,140
Acenaphthylene	208968	7.1E-3	NA	3.5E+1	NA	NA	0.2	1.0	0.1	1.0	3.6	3,460
Acetaldehyde (I)	75070	1.3E-1	NA	9.0E+0	2.2E-6	4.5E+4	0.2	1.0	0.1	1.0	-0.367	0.613
Acetate	71501	5.7E-1	NA	NA	NA	NA	0.2	NA	NA	NA	NA	NA
Acetic acid	64197	5.7E-1	NA	2.5E+2	NA	3.7E+4	0.2	1.0	0.1	1.0	-0.23	0.595
Acetone (I)	67641	1.0E-1	NA	5.9E+3	NA	1.7E+6	0.2	1.0	0.1	1.0	-0.240	0.581
Acetonitrile	75058	1.9E-2	NA	6.0E+1	NA	1.01E+5	0.2	1.0	0.1	1.0	-0.337	0.648
Acetophenone	98862	2.1E-1	NA	4.9E+2	NA	NA	0.2	1.0	0.1	1.0	1.6	37.4
Acrolein (I)	107028	1.6E-2	NA	2.0E-2	NA	6.9E+2	0.2	1.0	0.1	1.0	-0.01	1.18
Acrylamide	79061	2.0E-4	2.8E+0	6	1.3E-3	NA	0.2	1.0	0.1	1.0	-0.96	0.114
Acrylic acid	79107	5.3E-1	NA	1.0E+0	NA	NA	0.2	1.0	0.1	1.0	0.35	2.21
Acrylonitrile (I)	107131	NA	3.3E-1	2.0E+0	6.8E-5	NA	0.2	1.0	0.1	1.0	0.255	1.78
Alachlor	15972608	1.0E-2	9.6E-2	NA	NA	NA	0.2	0.5	0.1	1.0	3.52	734
Aldicarb	116063	1.0E-3	NA	NA	NA	NA	0.2	1.0	0.1	1.0	1.1	12.1
Aldicarb sulfone	1646884	1.1E-3	NA	NA	NA	NA	0.2	1.0	0.1	1.0	-0.57	0.275
Aldicarb sulfoxide	1646873	1.3E-3	NA	NA	NA	NA	0.2	1.0	0.1	1.0	-0.67	0.22
Aldrin	309002	2.5E-5	8.7E+0	NA	4.9E-3	NA	0.2	0.5	0.1	1.0	6.5	2.45E+6
Aluminum (B)	7429905	3.3E-1	NA	NA	NA	NA	0.2	0.5	0.01	1.0	NR	NR
Ammonia	7664417	NA	NA	1.0E+2	NA	2.4E+4	0.2	1.0	0.1	1.0	NA	NA
t-Amyl methyl ether (TAME)	994058	1.3E-1	NA	6.2E+1	NA	NA	0.2	1.0	0.1	1.0	1.73	28.1
Aniline	62533	NA	1.6E-2	1.0E+0	NA	NA	0.2	1.0	0.1	1.0	0.978	9.15

Attachment 1
TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

Developed pursuant to R 299.5752 of the Administrative Rules for Part 201 Environmental Remediation of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Scientific notation is represented by E+ or E- a value, for example 200,000 is presented as 2.0E+5. Units are as indicated in each column heading. The dataset for each hazardous substance requires 22 columns. Review all 22 columns across 2 pages when evaluating data for a specific hazardous substance.

Hazardous Substance	Chemical Abstract Service Number	Soil Koc for Ionizing Organic Compounds at pH=6.8	Soil-Water Distribution Coefficients for Inorganic Compounds at pH=6.8 (Kd)	Henry's Law Constant at 25°C (HLC)	Air Diffusivity (D_i or D_a or D^{air})	Water Diffusivity (D_w)	Lower Explosive Limit in Air (LEL)	Flash Point (FP)	Water Solubility (S)	Physical State at Standard Temperature & Pressure	Molecular Weight (MW)
		L/Kg	L/Kg	atm-m^3/mol	cm^2/s	cm^2/s	unitless	°F	ug/L	unitless	g/mol
Acenaphthene	83329	NR	NR	1.55E-4	0.0421	7.69E-6	NA	NA	4,240	Solid	154.2
Acenaphthylene	208968	NR	NR	1.48E-3	0.08	8.0E-6	NA	NA	3,930	Solid	152.271
Acetaldehyde (I)	75070	NR	NR	7.95E-5	0.08	8.0E-6	0.04	-36	1.0E+9	Liquid	44.1
Acetate	71501	NA	NA	NA	NA	NA	NA	NA	ID	NA	NA
Acetic acid	64197	NR	NR	1.00E-7	0.08	8.0E-6	0.04	103	6.0E+9	Liquid	60.05
Acetone (I)	67641	NR	NR	3.88E-5	0.124	1.14E-5	0.025	0.0	1.0E+9	Liquid	58.08
Acetonitrile	75058	NR	NR	2.40E-5	0.13	1.7E-5	0.03	42	2.00E+8	Liquid	41.05
Acetophenone	98862	NR	NR	1.1E-5	0.08	8.0E-6	NA	NA	6.1E+6	Liquid	120.2
Acrolein (I)	107028	NR	NR	9.40E-5	0.11	1.2E-5	0.028	-15	2.10E+8	Liquid	56.06
Acrylamide	79061	NR	NR	3.22E-10	0.097	1.1E-4	NA	280	2.20E+9	Solid	71.08
Acrylic acid	79107	NR	NR	3.20E-7	0.08	8.0E-6	0.024	121	1.0E+9	Liquid	72.06
Acrylonitrile (I)	107131	NR	NR	1.00E-4	0.12	1.3E-5	0.03	30	7.50E+7	Liquid	53.06
Alachlor	15972608	NR	NR	8.32E-9	0.08	8.0E-6	NA	NA	1.83E+5	Solid	269.77
Aldicarb	116063	NR	NR	4.17E-9	0.08	8.0E-6	NA	NA	6.00E+6	Solid	190.25
Aldicarb sulfone	1646884	NR	NR	3.37E-9	0.08	8.0E-6	NA	NA	7.80E+6	Solid	222.27
Aldicarb sulfoxide	1646873	NR	NR	9.69E-10	0.08	8.0E-6	NA	NA	2.80E+7	Solid	206.27
Aldrin	309002	NR	NR	1.70E-4	0.0132	4.86E-6	NA	NA	180	Solid	364.9
Aluminum (B)	7429905	NR	NA	NR	NR	NR	NA	NA	NA	Inorganic	26.982
Ammonia	7664417	NR	NR	3.20E-4	0.08	8.0E-6	0.15	NA	5.30E+8	Liquid	17.04
t-Amyl methyl ether (TAME)	994058	NR	NR	2.68E-3	0.08	8.0E-6	NA	NA	2.64E+6	Liquid	102.18
Aniline	62533	NR	NR	2.30E-6	0.07	8.3E-6	0.013	158	3.60E+7	Liquid	93.13

Attachment 1

TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

Developed pursuant to R 299.5752 of the Administrative Rules for Part 201 Environmental Remediation of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Scientific notation is represented by E+ or E- a value, for example 200,000 is presented as 2.0E+5. Units are as indicated in each column heading. The dataset for each hazardous substance requires 22 columns. Review all 22 columns across 2 pages when evaluating data for a specific hazardous substance.

Hazardous Substance	Chemical Abstract Service Number	Oral Reference Dose (RFD)	Oral Slope Factor (SF)	Chronic Inhalation Reference Concentration (RfC)	Inhalation Unit Risk Factor (IURF)	Occupational Short Term Exposure Level (STEL)	Relative Source Contribution for Drinking Water (RSC)	Ingestion Absorption Efficiency (AEi)	Dermal Absorption Efficiency (AEd)	Relative Source Contribution for Soil (RSC)	Log Octanol-Water Partition Coefficient (Log Kow)	Soil Organic Carbon-Water Partition Coefficients for Organic Compounds (Koc)
		mg/Kg-day	$(mg/Kg\text{-}day)^{-1}$	ug/m^3	$(ug/m^3)^{-1}$	ug/m^3	unitless	unitless	unitless	unitless	unitless	L/Kg
Anthracene	120127	1.0E+0	NA	1.0E+3	NA	NA	0.2	1.0	0.1	1.0	4.55	29,700
Antimony	7440360	3.5E-4	NA	2.0E-1	NA	NA	0.2	0.5	0.01	1.0	NR	NR
Arsenic	7440382	2.7E-4	1.5E+0	NA	4.3E-3	NA	0.2	0.5	0.03	1.0	NR	NR
Asbestos (BB)	1332214	NA	NA	NA	4.6E-2	NA	1.0	1.0	0	1.0	NR	NR
Atrazine	1912249	3.5E-2	7.4E-2	NA	NA	NA	0.2	1.0	0.1	1.0	2.7	451
Azobenzene	103333	NA	3.7E-2	NA	3.1E-5	NA	0.2	1.0	0.1	1.0	3.82	5,690
Barium (B)	7440393	7.0E-2	NA	5.0E+0	NA	NA	1.0	0.5	0.01	1.0	NR	NR
Benzene (I)	71432	NA	2.9E-2	30	8.3E-6	8.0E+3	0.2	1.0	0.1	1.0	2.13	58.2
Benzidine	92875	2.7E-3	2.3E+2	NA	6.7E-2	NA	0.2	1.0	0.1	1.0	1.66	42.9
Benzo(a)anthracene (Q)	56553	NA	4.1E-1	NA	NA	NA	0.2	0.5	0.13	1.0	5.7	4.01E+5
Benzo(b)fluoranthene (Q)	205992	NA	4.1E-1	NA	NA	NA	0.2	0.5	0.13	1.0	6.2	1.24E+6
Benzo(k)fluoranthene (Q)	207089	NA	4.1E-2	NA	NA	NA	0.2	0.5	0.13	1.0	6.2	1.24E+6
Benzo(g,h,i)perylene	191242	7.1E-3	NA	1.2E+1	NA	NA	0.2	0.5	0.13	1.0	6.7	3.86E+6
Benzo(a)pyrene (Q)	50328	NA	4.1E+0	NA	2.1E-3	NA	0.2	0.5	0.13	1.0	6.11	1.01E+6
Benzoic acid	65850	4.4E+0	NA	NA	NA	NA	0.2	1.0	0.1	1.0	1.86	0.6
Benzyl alcohol	100516	1.4E+0	NA	5.0E+3	NA	NA	0.2	1.0	0.1	1.0	1.11	12.3
Benzyl chloride	100447	NA	1.1E-1	NA	5.0E-5	NA	0.2	1.0	0.1	1.0	2.30	182
Beryllium	7440417	1.5E-3	NA	2.0E-2	2.4E-3	1.0E+1	0.2	1.0	0	1.0	NR	NR
bis(2-Chloroethoxy)ethane	112265	NA	NA	NA	NA	NA	0.2	1.0	0.1	1.0	1.28	18.1
bis(2-Chloroethyl)ether (I)	111444	NA	4.2E-1	NA	3.3E-4	5.8E+4	0.2	1.0	0.1	1.0	1.21	10.9
bis(2-Ethylhexyl)phthalate	117817	1.9E-2	3.2E-3	NA	4.43E-6	1.0E+4	0.2	0.5	0.1	1.0	7.3	1.50E+7

Attachment 1
TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

Developed pursuant to R 299.5752 of the Administrative Rules for Part 201 Environmental Remediation of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Scientific notation is represented by E+ or E- a value, for example 200,000 is presented as 2.0E+5. Units are as indicated in each column heading. The dataset for each hazardous substance requires 22 columns. Review all 22 columns across 2 pages when evaluating data for a specific hazardous substance.

Hazardous Substance	Chemical Abstract Service Number	Soil Koc for Ionizing Organic Compounds at pH=6.8	Soil-Water Distribution Coefficients for Inorganic Compounds at pH=6.8 (Kd)	Henry's Law Constant at 25°C (HLC)	Air Diffusivity (D_i or D_a or D^{air})	Water Diffusivity (D_w)	Lower Explosive Limit in Air (LEL)	Flash Point (FP)	Water Solubility (S)	Physical State at Standard Temperature & Pressure	Molecular Weight (MW)
		L/Kg	L/Kg	atm-m^3/mol	cm^2/s	cm^2/s	unitless	°F	ug/L	unitless	g/mol
Anthracene	120127	NR	NR	6.50E-5	0.0324	7.74E-6	NA	NA	43.4	Solid	178.24
Antimony	7440360	NR	45	NR	NR	NR	NA	NA	NA	Inorganic	121.760
Arsenic	7440382	NR	29	NR	NR	NR	NA	NA	NA	Inorganic	74.922
Asbestos (BB)	1332214	NR	NA	NR	NR	NR	NR	NR	NA	Inorganic	NA
Atrazine	1912249	NR	NR	2.63E-9	0.08	8.0E-6	NA	NA	70,000	Solid	215.72
Azobenzene	103333	NR	NR	1.35E-5	0.08	8.0E-6	NA	NA	6,400	Solid	182.23
Barium (B)	7440393	NR	41	NR	NR	NR	NA	NA	NA	Inorganic	137.327
Benzene (I)	71432	NR	NR	5.55E-3	0.088	9.8E-6	0.012	12	1.75E+6	Liquid	78.11
Benzidine	92875	NR	NR	3.90E-11	0.08	1.5E-5	NA	NA	5.20E+5	Solid	184.24
Benzo(a)anthracene (Q)	56553	NR	NR	3.35E-6	0.051	9.0E-6	NA	NA	9.4	Solid	228.3
Benzo(b)fluoranthene (Q)	205992	NR	NR	1.11E-4	0.0226	5.56E-6	NA	NA	1.5	Solid	252.32
Benzo(k)fluoranthene (Q)	207089	NR	NR	8.29E-7	0.0226	5.56E-6	NA	NA	0.8	Solid	252.32
Benzo(g,h,i)perylene	191242	NR	NR	5.34E-8	0.08	8.0E-6	NA	NA	0.26	Solid	276.34
Benzo(a)pyrene (Q)	50328	NR	NR	1.13E-6	0.043	9.0E-6	NA	NA	1.62	Solid	252.32
Benzoic acid	65850	0.6	NR	1.54E-6	0.0536	7.97E-6	NA	NA	3.50E+6	Solid	122.1
Benzyl alcohol	100516	NR	NR	3.90E-7	0.08	8.0E-6	NA	NA	4.40E+7	Liquid	108.13
Benzyl chloride	100447	NR	NR	4.00E-4	0.075	7.8E-6	0.011	153	4.90E+5	Liquid	126.58
Beryllium	7440417	NR	790	NR	NR	NR	NA	NA	NA	Inorganic	9.012
bis(2-Chloroethoxy)ethane	112265	NR	NR	7.81E-7	0.08	8.0E-6	NA	NA	1.89E+7	Liquid	187.07
bis(2-Chloroethyl)ether (I)	111444	NR	NR	1.80E-5	0.0692	7.53E-6	0.027	131	1.72E+7	Liquid	143.01
bis(2-Ethylhexyl)phthalate	117817	NR	NR	1.02E-7	0.0351	3.66E-6	NA	420	340	Liquid	390.57

Attachment 1

TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

Developed pursuant to R 299.5752 of the Administrative Rules for Part 201 Environmental Remediation of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Scientific notation is represented by E+ or E- a value, for example 200,000 is presented as 2.0E+5. Units are as indicated in each column heading. The dataset for each hazardous substance requires 22 columns. Review all 22 columns across 2 pages when evaluating data for a specific hazardous substance.

Hazardous Substance	Chemical Abstract Service Number	Oral Reference Dose (RFD)	Oral Slope Factor (SF)	Chronic Inhalation Reference Concentration (RfC)	Inhalation Unit Risk Factor (IURF)	Occupational Short Term Exposure Level (STEL)	Relative Source Contribution for Drinking Water (RSC)	Ingestion Absorption Efficiency (AEi)	Dermal Absorption Efficiency (AEd)	Relative Source Contribution for Soil (RSC)	Log Octanol-Water Partition Coefficient (Log Kow)	Soil Organic Carbon-Water Partition Coefficients for Organic Compounds (Koc)
		mg/Kg-day	$(mg/Kg-day)^{-1}$	ug/m^3	$(ug/m^3)^{-1}$	ug/m^3	unitless	unitless	unitless	unitless	unitless	L/Kg
Boron (B)	7440428	3.2E-1	NA	NA	NA	NA	0.2	0.5	0.01	1.0	NR	NR
Bromate	15541454	4.0E-3	7.0E-1	NA	NA	NA	0.2	0.5	0.01	1.0	0.63	NR
Bromobenzene (I)	108861	2.4E-3	NA	8.0E+0	NA	NA	0.2	1.0	0.1	1.0	2.99	870
Bromodichloromethane	75274	1.8E-2	5.0E-2	NA	3.7E-5	NA	0.2	1.0	0.1	1.0	2.1	55.1
Bromoform	75252	1.8E-2	6.4E-3	NA	1.1E-6	NA	0.2	1.0	0.1	1.0	2.35	87.0
Bromomethane	74839	1.4E-3	NA	5.0E+0	NA	NA	0.2	1.0	0.1	1.0	1.18	14.5
n-Butanol (I)	71363	1.3E-1	NA	3.5E+2	NA	1.52E+5	0.2	1.0	0.1	1.0	0.851	5.65
2-Butanone (MEK) (I)	78933	1.8E+0	NA	1.0E+3	NA	8.85E+5	0.2	1.0	0.1	1.0	0.279	1.99
n-Butyl acetate	123864	7.6E-2	NA	7.1E+3	NA	9.5E+5	0.2	1.0	0.1	1.0	1.78	30.8
t-Butyl alcohol	75650	5.4E-1	NA	1.89E+3	NA	NA	0.2	1.0	0.1	1.0	0.35	2.27
Butyl benzyl phthalate	85687	1.6E-1	NA	7.0E+2	NA	NA	0.2	1.0	0.1	1.0	4.84	57,300
n-Butylbenzene	104518	1.1E-2	NA	30	NA	NA	0.2	1.0	0.1	1.0	4.38	20,200
sec-Butylbenzene	135988	1.1E-2	NA	6E+0	NA	NA	0.2	1.0	0.1	1.0	4.57	31,100
t-Butylbenzene (I)	98066	1.1E-2	NA	10	NA	NA	0.2	1.0	0.1	1.0	4.11	11,000
Cadmium (B)	7440439	1.0E-3	NA	NA	1.8E-3	NA	0.2	0.5	0.001	1.0	NR	NR
Camphene (I)	79925	NA	NA	80	NA	NA	0.2	1.0	0.1	1.0	3.53	2,950
Caprolactam	105602	8.0E-1	NA	1.0E+1	NA	4.6E+4	0.2	1.0	0.1	1.0	-0.19	0.65
Carbaryl	63252	9.6E-2	NA	NA	NA	NA	0.2	1.0	0.1	1.0	2.4	229
Carbazole	86748	NA	1.0E-2	NA	5.0E-5	NA	0.2	1.0	0.1	1.0	3.59	3,380
Carbofuran	1563662	5.0E-3	NA	NA	NA	NA	0.2	1.0	0.1	1.0	1.6	37.4
Carbon disulfide (I,R)	75150	1.1E-1	NA	7.0E+2	NA	NA	0.2	1.0	0.1	1.0	2	45.9

Attachment 1
TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

Developed pursuant to R 299.5752 of the Administrative Rules for Part 201 Environmental Remediation of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Scientific notation is represented by E+ or E- a value, for example 200,000 is presented as 2.0E+5. Units are as indicated in each column heading. The dataset for each hazardous substance requires 22 columns. Review all 22 columns across 2 pages when evaluating data for a specific hazardous substance.

Hazardous Substance	Chemical Abstract Service Number	Soil Koc for Ionizing Organic Compounds at pH=6.8	Soil-Water Distribution Coefficients for Inorganic Compounds at pH=6.8 (Kd)	Henry's Law Constant at 25°C (HLC)	Air Diffusivity (D_i or D_a or D^{air})	Water Diffusivity (D_w)	Lower Explosive Limit in Air (LEL)	Flash Point (FP)	Water Solubility (S)	Physical State at Standard Temperature & Pressure	Molecular Weight (MW)
		L/Kg	L/Kg	atm-m^3/mol	cm^2/s	cm^2/s	unitless	°F	ug/L	unitless	g/mol
Boron (B)	7440428	NR	NA	NR	NR	NR	NA	NA	NA	Inorganic	10.811
Bromate	15541454	NR	NA	1.00E+0	NR	NR	NA	NA	38,000	Solid	79.9
Bromobenzene (I)	108861	NR	NR	4.74E-4	0.08	8.0E-6	NA	NA	4.13E+5	Liquid	157.015
Bromodichloromethane	75274	NR	NR	1.60E-3	0.0298	1.06E-5	NA	NA	6.74E+6	Liquid	163.8
Bromoform	75252	NR	NR	5.35E-4	0.0149	1.03E-5	NA	NA	3.10E+6	Liquid	252.8
Bromomethane	74839	NR	NR	1.42E-2	0.08	8.0E-6	0.1	NA	1.45E+7	Liquid	94.94
n-Butanol (I)	71363	NR	NR	8.81E-6	0.08	9.6E-6	0.014	84	7.40E+7	Liquid	74.14
2-Butanone (MEK) (I)	78933	NR	NR	3.60E-5	0.081	9.8E-6	NA	16	2.40E+8	Liquid	72.1
n-Butyl acetate	123864	NR	NR	3.20E-4	0.08	8.0E-6	0.017	72	6.70E+6	Liquid	116.16
t-Butyl alcohol	75650	NR	NR	1.17E-5	0.08	8.0E-6	0.024	52	1.0E+9	Liquid	74.12
Butyl benzyl phthalate	85687	NR	NR	1.26E-6	0.0174	4.83E-6	NA	NA	2,690	Liquid	312.37
n-Butylbenzene	104518	NR	NR	NA	0.08	8.0E-6	NA	NA	NA	Liquid	134.22
sec-Butylbenzene	135988	NR	NR	NA	0.08	8.0E-6	NA	NA	NA	Liquid	134.22
t-Butylbenzene (I)	98066	NR	NR	NA	0.08	8.0E-6	NA	NA	NA	Liquid	134.22
Cadmium (B)	7440439	NR	75	NR	NR	NR	NA	NA	NA	Inorganic	112.411
Camphene (I)	79925	NR	NR	2.05E+0	0.08	8.0E-6	NA	NA	33,400	Solid	136.26
Caprolactam	105602	NR	NR	2.53E-8	0.08	8.0E-6	0.014	282	5.25E+9	Solid	113.2
Carbaryl	63252	NR	NR	6.80E-4	0.08	8.0E-6	NA	NA	1.26E+5	Solid	201.24
Carbazole	86748	NR	NR	1.53E-8	0.039	7.03E-6	NA	NA	7,480	Solid	167.21
Carbofuran	1563662	NR	NR	3.90E-10	0.08	8.0E-6	NA	NA	7.00E+5	Solid	221.3
Carbon disulfide (I,R)	75150	NR	NR	3.03E-2	0.104	1.0E-5	0.013	-22	1.19E+6	Liquid	76.14

TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

Developed pursuant to R 299.5752 of the Administrative Rules for Part 201 Environmental Remediation of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Scientific notation is represented by E+ or E- a value, for example 200,000 is presented as 2.0E+5. Units are as indicated in each column heading. The dataset for each hazardous substance requires 22 columns. Review all 22 columns across 2 pages when evaluating data for a specific hazardous substance.

Hazardous Substance	Chemical Abstract Service Number	Oral Reference Dose (RFD)	Oral Slope Factor (SF)	Chronic Inhalation Reference Concentration (RfC)	Inhalation Unit Risk Factor (IURF)	Occupational Short Term Exposure Level (STEL)	Relative Source Contribution for Drinking Water (RSC)	Ingestion Absorption Efficiency (AEi)	Dermal Absorption Efficiency (AEd)	Relative Source Contribution for Soil (RSC)	Log Octanol-Water Partition Coefficient (Log Kow)	Soil Organic Carbon-Water Partition Coefficients for Organic Compounds (Koc)
		mg/Kg-day	$(mg/Kg\text{-}day)^{-1}$	ug/m^3	$(ug/m^3)^{-1}$	ug/m^3	unitless	unitless	unitless	unitless	unitless	L/Kg
Carbon tetrachloride	56235	7.1E-4	5.5E-2	100	2.36E-5	6.3E+4	0.2	1.0	0.1	1.0	2.73	174
Chlordane (J)	57749	1.5E-3	3.5E-1	7.0E-1	1.0E-4	NA	0.2	0.5	0.04	1.0	6.32	1.21E+5
Chloride	16887006	NA	NA	NA	NA	NA	0.2	0.5	0.01	1.0	NR	NR
Chlorobenzene (I)	108907	1.9E-2	NA	7.0E+1	NA	NA	0.2	1.0	0.1	1.0	2.86	220
p-Chlorobenzene sulfonic acid	98668	1.0E+0	NA	NA	NA	NA	0.2	1.0	0.1	1.0	-0.52	4.64E-1
1-Chloro-1,1-difluoroethane	75683	2.1E+0	NA	5.0E+4	NA	NA	0.2	1.0	0.1	1.0	1.81	32.5
Chloroethane	75003	1.8E+1	2.0E-3	1.0E+4	NA	NA	0.2	1.0	0.1	1.0	1.4	23.8
2-Chloroethyl vinyl ether	110758	NA	NA	NA	NA	NA	0.2	1.0	0.1	1.0	1.07	8.43
Chloroform	67663	1.3E-2	4.4E-3	NA	2.4E-6	NA	0.2	1.0	0.1	1.0	1.92	39.7
Chloromethane (I)	74873	NA	3.3E-3	9.0E+1	6.39E-7	2.07E+5	0.2	1.0	0.1	1.0	0.91	6.30
4-Chloro-3-methylphenol	59507	2.0E-2	NA	NA	NA	NA	0.2	1.0	0.1	1.0	3.1	1,120
beta-Chloronaphthalene	91587	2.5E-1	NA	NA	NA	NA	0.2	1.0	0.1	1.0	4.1	10,700
2-Chlorophenol	95578	6.2E-3	NA	1.8E+1	NA	NA	0.2	1.0	0.1	1.0	2.15	388
o-Chlorotoluene (I)	95498	2.0E-2	NA	7.0E+1	NA	NA	0.2	1.0	0.1	1.0	3.42	612
Chlorpyrifos	2921882	3.0E-2	NA	2.0E+0	NA	NA	0.2	0.5	0.1	1.0	5.3	18,900
Chromium (III) (B,H)	16065831	1.5E+0	NA	5.0E+0	NA	NA	0.7	0.5	0.01	1.0	NR	NR
Chromium (VI)	18540299	4.8E-3	NA	8.0E-3	1.2E-2	NA	0.7	0.5	0.01	1.0	NR	NR
Chrysene (Q)	218019	NA	4.1E-3	NA	NA	NA	0.2	0.5	0.13	1.0	5.7	4.01E+5
Cobalt	7440484	5.0E-3	NA	2.0E-1	NA	NA	0.2	0.5	0.01	1.0	NR	NR
Copper (B)	7440508	3.8E-2	NA	2.0E+0	NA	NA	1.0	0.5	0.01	1.0	NR	NR
Cyanazine	21725462	3.0E-3	3.7E-1	NA	NA	NA	0.2	1.0	0.1	1.0	2.2	146

Attachment 1
TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

Developed pursuant to R 299.5752 of the Administrative Rules for Part 201 Environmental Remediation of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Scientific notation is represented by E+ or E- a value, for example 200,000 is presented as 2.0E+5. Units are as indicated in each column heading. The dataset for each hazardous substance requires 22 columns. Review all 22 columns across 2 pages when evaluating data for a specific hazardous substance.

Hazardous Substance	Chemical Abstract Service Number	Soil Koc for Ionizing Organic Compounds at pH=6.8	Soil-Water Distribution Coefficients for Inorganic Compounds at pH=6.8 (Kd)	Henry's Law Constant at 25°C (HLC)	Air Diffusivity (D_i or D_a or D^{air})	Water Diffusivity (D_w)	Lower Explosive Limit in Air (LEL)	Flash Point (FP)	Water Solubility (S)	Physical State at Standard Temperature & Pressure	Molecular Weight (MW)
		L/Kg	L/Kg	atm-m^3/mol	cm^2/s	cm^2/s	unitless	°F	ug/L	unitless	g/mol
Carbon tetrachloride	56235	NR	NR	3.04E-2	0.078	8.8E-6	NA	NA	7.93E+5	Liquid	153.92
Chlordane (J)	57749	NR	NR	4.86E-5	0.0118	4.37E-6	NA	NA	56	Solid	409.8
Chloride	16887006	NR	NA	NR	NR	NR	NA	NA	NA	Inorganic	35.453
Chlorobenzene (I)	108907	NR	NR	3.70E-3	0.073	8.7E-6	0.013	82	4.72E+5	Liquid	112.56
p-Chlorobenzene sulfonic acid	98668	NR	NR	NA	NA	NA	NA	226	NA	Solid	192.62
1-Chloro-1,1-difluoroethane	75683	NR	NR	6.16E-2	0.08	8.0E-6	0.06	NA	3.9E+06	Gas	100.5
Chloroethane	75003	NR	NR	8.80E-3	0.08	8.0E-6	0.038	-58	5.74E+6	Liquid	64.52
2-Chloroethyl vinyl ether	110758	NR	NR	6.25E-4	0.08	8.0E-6	NA	NA	1.50E+7	Liquid	106.55
Chloroform	67663	NR	NR	3.67E-3	0.104	1.0E-5	NA	NA	7.92E+6	Liquid	119.38
Chloromethane (I)	74873	NR	NR	4.52E-2	0.13	6.5E-6	0.081	-60.8	6.34E+6	Liquid	50.49
4-Chloro-3-methylphenol	59507	NR	NR	4.00E-7	0.08	8.0E-6	NA	NA	3.90E+6	Solid	142.6
beta-Chloronaphthalene	91587	NR	NR	3.10E-4	0.08	8.0E-6	NA	NA	6,740	Solid	162.62
2-Chlorophenol	95578	388	NR	3.91E-4	0.0501	9.46E-6	NA	NA	2.20E+7	Liquid	128.56
o-Chlorotoluene (I)	95498	NR	NR	3.57E-3	0.08	8.0E-6	NA	96	3.73E+5	Liquid	126.58
Chlorpyrifos	2921882	NR	NR	7.80E+0	0.08	8.0E-6	NA	NA	1,120	Solid	350.59
Chromium (III) (B,H)	16065831	NR	1.8E+6	NR	NR	NR	NA	NA	NA	Inorganic	51.996
Chromium (VI)	18540299	NR	19	NR	NR	NR	NA	NA	NA	Inorganic	51.996
Chrysene (Q)	218019	NR	NR	9.46E-5	0.0248	6.21E-6	NA	NA	1.6	Solid	228.3
Cobalt	7440484	NR	NA	NR	NR	NR	NA	NA	NA	Inorganic	58.933
Copper (B)	7440508	NR	360	NR	NR	NR	NA	NA	NA	Inorganic	63.546
Cyanazine	21725462	NR	NR	1.00E-10	0.08	8.0E-6	NA	NA	1.70E+5	Solid	241

Attachment 1

TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

Developed pursuant to R 299.5752 of the Administrative Rules for Part 201 Environmental Remediation of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Scientific notation is represented by E+ or E- a value, for example 200,000 is presented as 2.0E+5. Units are as indicated in each column heading. The dataset for each hazardous substance requires 22 columns. Review all 22 columns across 2 pages when evaluating data for a specific hazardous substance.

Hazardous Substance	Chemical Abstract Service Number	Oral Reference Dose (RFD)	Oral Slope Factor (SF)	Chronic Inhalation Reference Concentration (RfC)	Inhalation Unit Risk Factor (IURF)	Occupational Short Term Exposure Level (STEL)	Relative Source Contribution for Drinking Water (RSC)	Ingestion Absorption Efficiency (AEi)	Dermal Absorption Efficiency (AEd)	Relative Source Contribution for Soil (RSC)	Log Octanol-Water Partition Coefficient (Log Kow)	Soil Organic Carbon-Water Partition Coefficients for Organic Compounds (Koc)
		mg/Kg-day	(mg/Kg-day)$^{-1}$	ug/m^3	(ug/m^3)$^{-1}$	ug/m^3	unitless	unitless	unitless	unitless	unitless	L/Kg
Cyanide (P,R)	57125	5.4E-3	NA	5.0E+1	NA	NA	0.2	1.0	0	1.0	NA	NA
Cyclohexanone	108941	4.5E+0	NA	1.0E+3	NA	NA	0.2	1.0	0.1	1.0	0.81	6.26
Dacthal	1861321	1.0E-2	NA	NA	NA	NA	0.2	1.0	0.1	1.0	4.4	21,200
Dalapon	75990	8.5E-2	NA	NA	NA	NA	0.2	1.0	0.1	1.0	0.77	5.72
4-4'-DDD	72548	3.0E-3	9.4E-2	NA	7.0E-5	NA	0.2	0.5	0.1	1.0	6.1	81,100
4-4'-DDE	72559	7.0E-4	2.0E-1	NA	9.7E-5	NA	0.2	0.5	0.1	1.0	6.76	2.70E+5
4-4'-DDT	50293	5.0E-4	2.0E-1	NA	9.7E-5	NA	0.2	0.5	0.03	1.0	6.53	1.78E+5
Decabromodiphenyl ether	1163195	1.0E-2	NA	3.5E+1	4.0E-7	NA	0.2	0.5	0.1	1.0	5.24	1.42E+5
Di-n-butyl phthalate	84742	1.2E-1	NA	5.0E+1	NA	NA	0.2	1.0	0.1	1.0	4.61	34,000
Di(2-ethylhexyl) adipate	103231	1.7E+0	5.9E-4	NA	3.4E-7	NA	0.2	0.5	0.1	1.0	6.11	1.01E+6
Di-n-octyl phthalate	117840	1.8E-2	NA	4.7E+2	NA	NA	0.2	0.5	0.1	1.0	7.51	2.41E+7
Diacetone alcohol (I)	123422	NA	NA	2.4E+3	NA	NA	0.2	1.0	0.1	1.0	-0.34	0.464
Diazinon	333415	1.8E-4	NA	NA	NA	NA	0.2	1.0	0.1	1.0	3.4	2,200
Dibenzo(a,h)anthracene (Q)	53703	NA	4.1E+0	NA	NA	NA	0.2	0.5	0.13	1.0	6.69	3.77E+6
Dibenzofuran	132649	NA	NA	1E-1	NA	NA	0.2	1.0	0.1	1.0	4.2	13,500
Dibromochloromethane	124481	2.1E-2	4.9E-2	NA	2.45E-5	NA	0.2	1.0	0.1	1.0	2.17	62.6
Dibromochloropropane	96128	NA	1.2E+0	2.0E-1	NA	NA	0.2	1.0	0.1	1.0	2.68	431
Dibromomethane	74953	1.1E-2	NA	NA	NA	NA	0.2	1.0	0.1	1.0	1.62	39.2
Dicamba	1918009	3.0E-2	NA	NA	NA	NA	0.2	0.5	0.1	1.0	2.4	95.3
1,2-Dichlorobenzene	95501	8.6E-2	NA	1.5E+3	NA	3.01E+5	0.2	1.0	0.1	1.0	3.43	623
1,3-Dichlorobenzene	541731	9.0E-4	NA	3E+0	NA	NA	0.2	1.0	0.1	1.0	3.5	708

Attachment 1
TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

Developed pursuant to R 299.5752 of the Administrative Rules for Part 201 Environmental Remediation of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Scientific notation is represented by E+ or E- a value, for example 200,000 is presented as 2.0E+5. Units are as indicated in each column heading. The dataset for each hazardous substance requires 22 columns. Review all 22 columns across 2 pages when evaluating data for a specific hazardous substance.

Hazardous Substance	Chemical Abstract Service Number	Soil Koc for Ionizing Organic Compounds at pH=6.8	Soil-Water Distribution Coefficients for Inorganic Compounds at pH=6.8 (Kd)	Henry's Law Constant at 25°C (HLC)	Air Diffusivity (D_i or D_d or D^{air})	Water Diffusivity (D_w)	Lower Explosive Limit in Air (LEL)	Flash Point (FP)	Water Solubility (S)	Physical State at Standard Temperature & Pressure	Molecular Weight (MW)
		L/Kg	L/Kg	atm-m^3/mol	cm^2/s	cm^2/s	unitless	°F	ug/L	unitless	g/mol
Cyanide (P,R)	57125	NR	NR	NR	0.08	8.0E-6	NA	NA	NA	Inorganic	26.02
Cyclohexanone	108941	NR	NR	7.80E+0	0.08	8.0E-6	NA	146	2.30E+7	Liquid	98.14
Dacthal	1861321	NR	NR	2.18E-6	0.08	8.0E-6	NA	NA	500	Solid	331
Dalapon	75990	NR	NR	6.43E-8	0.08	8.0E-6	NA	NA	5.02E+8	Liquid	142.97
4-4'-DDD	72548	NR	NR	4.00E-6	0.0169	4.76E-6	NA	NA	90	Solid	320.05
4-4'-DDE	72559	NR	NR	2.10E-5	0.0144	5.87E-6	NA	NA	120	Solid	518.03
4-4'-DDT	50293	NR	NR	8.10E-6	0.0137	4.95E-6	NA	162	25	Solid	354.49
Decabromodiphenyl ether	1163195	NR	NR	4.02E-5	0.08	8.0E-6	NA	NA	30	Solid	959.22
Di-n-butyl phthalate	84742	NR	NR	9.38E-10	0.0438	7.86E-6	NA	315	11,200	Liquid	278.34
Di(2-ethylhexyl) adipate	103231	NR	NR	4.34E-7	0.08	8.0E-6	NA	NA	471	Liquid	370
Di-n-octyl phthalate	117840	NR	NR	7.66E-7	0.0151	3.58E-6	NA	NA	3,000	Liquid	390.62
Diacetone alcohol (I)	123422	NR	NR	2.61E-7	0.08	8.0E-6	0.018	125	1.0E+9	Liquid	116.2
Diazinon	333415	NR	NR	1.13E-7	0.08	8.0E-6	NA	180	68,800	Liquid	304.3
Dibenzo(a,h)anthracene (Q)	53703	NR	NR	1.47E-8	0.0202	5.18E-6	NA	NA	2.49	Solid	278.36
Dibenzofuran	132649	NR	NR	1.30E-5	0.08	8.0E-6	NA	NA	10,000	Solid	168.21
Dibromochloromethane	124481	NR	NR	7.83E-4	0.0229	1.05E-5	NA	NA	2.60E+6	Liquid	208.29
Dibromochloropropane	96128	NR	NR	1.90E-4	0.08	8.0E-6	NA	170	1,230	Liquid	236.34
Dibromomethane	74953	NR	NR	9.00E-4	0.08	8.6E-6	NA	NA	1.10E+7	Liquid	173.85
Dicamba	1918009	NR	NR	7.90E-9	0.08	8.0E-6	NA	NA	4.5E+6	Solid	221.04
1,2-Dichlorobenzene	95501	NR	NR	1.90E-3	0.069	7.9E-6	0.022	151	1.56E+5	Liquid	147.01
1,3-Dichlorobenzene	541731	NR	NR	1.80E-3	0.08	8.0E-6	NA	NA	1.11E+5	Liquid	147.01

Attachment 1

TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

Developed pursuant to R 299.5752 of the Administrative Rules for Part 201 Environmental Remediation of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Scientific notation is represented by E+ or E- a value, for example 200,000 is presented as 2.0E+5. Units are as indicated in each column heading. The dataset for each hazardous substance requires 22 columns. Review all 22 columns across 2 pages when evaluating data for a specific hazardous substance.

Hazardous Substance	Chemical Abstract Service Number	Oral Reference Dose (RFD)	Oral Slope Factor (SF)	Chronic Inhalation Reference Concentration (RfC)	Inhalation Unit Risk Factor (IURF)	Occupational Short Term Exposure Level (STEL)	Relative Source Contribution for Drinking Water (RSC)	Ingestion Absorption Efficiency (AEi)	Dermal Absorption Efficiency (AEd)	Relative Source Contribution for Soil (RSC)	Log Octanol-Water Partition Coefficient (Log Kow)	Soil Organic Carbon-Water Partition Coefficients for Organic Compounds (Koc)
		mg/Kg-day	$(mg/Kg\text{-}day)^{-1}$	ug/m^3	$(ug/m^3)^{-1}$	ug/m^3	unitless	unitless	unitless	unitless	unitless	L/Kg
1,4-Dichlorobenzene	106467	NA	1.3E-2	8E+2	6.9E-6	NA	0.2	1.0	0.1	1.0	3.42	612
3,3'-Dichlorobenzidine	91941	NA	8.0E-1	NA	4.8E-4	NA	0.2	1.0	0.1	1.0	3.51	721
Dichlorodifluoromethane	75718	2.3E-1	NA	4.95E+4	NA	NA	0.2	1.0	0.1	1.0	2.15	60.4
1,1-Dichloroethane	75343	1.2E-1	NA	5.0E+2	NA	NA	0.2	1.0	0.1	1.0	1.79	31.3
1,2-Dichloroethane (I)	107062	NA	5.8E-2	NA	2.6E-5	NA	0.2	1.0	0.1	1.0	1.47	17.5
1,1-Dichloroethylene (I)	75354	9.0E-4	NA	2E+2	5.0E-5	7.9E+4	0.2	1.0	0.1	1.0	2.13	58.2
cis-1,2-Dichloroethylene	156592	1.1E-2	NA	3.4E+1	NA	NA	0.2	1.0	0.1	1.0	1.86	35.6
trans-1,2-Dichloroethylene	156605	1.7E-2	NA	7.0E+1	NA	NA	0.2	1.0	0.1	1.0	2.07	52.2
2,6-Dichloro-4-nitroaniline	99309	3.0E-1	NA	NA	NA	NA	0.2	1.0	0.1	1.0	2.76	517
2,4-Dichlorophenol	120832	1.0E-2	NA	7.7E+1	NA	NA	0.2	1.0	0.1	1.0	3.08	147
2,4-Dichlorophenoxyacetic acid	94757	1.0E-2	NA	1.0E+2	NA	NA	0.2	1.0	0.05	1.0	2.7	451
1,2-Dichloropropane (I)	78875	4.4E-1	3.7E-2	4.0E+0	NA	5.08E+5	0.2	1.0	0.1	1.0	1.97	43.5
1,3-Dichloropropene	542756	3.4E-2	1.0E-1	2.0E+1	4.0E-6	NA	0.2	1.0	0.1	1.0	2.0	45.9
Dichlorovos	62737	4.0E-4	5.2E-1	5.0E-1	NA	NA	0.2	1.0	0.1	1.0	1.4	15.4
Dicyclohexyl phthalate	84617	NA	NA	NA	NA	NA	0.2	0.5	0.1	1.0	6.2	1.24E+6
Dieldrin	60571	7.6E-5	8.0E+0	NA	4.6E-3	NA	0.2	0.5	0.1	1.0	5.37	21,400
Diethyl ether	60297	5.0E-1	NA	1.2E+4	NA	1.52E+6	0.2	1.0	0.1	1.0	0.83	6.55
Diethyl phthalate	84662	7.5E-1	NA	5.0E+1	NA	NA	0.2	1.0	0.1	1.0	2.5	287
Diethylene glycol monobutyl ether	112345	1.2E-2	NA	2.0E+1	NA	NA	0.2	1.0	0.1	1.0	0.32	2.06
Diisopropyl ether	108203	4.1E-3	NA	3.58E+2	NA	NA	0.2	1.0	0.1	1.0	1.67	25.2
Diisopropylamine (I)	108189	7.7E-4	NA	2E+2	NA	NA	0.2	1.0	0.1	1.0	1.6	37.4

Attachment 1
TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

Developed pursuant to R 299.5752 of the Administrative Rules for Part 201 Environmental Remediation of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Scientific notation is represented by E+ or E- a value, for example 200,000 is presented as 2.0E+5. Units are as indicated in each column heading. The dataset for each hazardous substance requires 22 columns. Review all 22 columns across 2 pages when evaluating data for a specific hazardous substance.

Hazardous Substance	Chemical Abstract Service Number	Soil Koc for Ionizing Organic Compounds at pH=6.8	Soil-Water Distribution Coefficients for Inorganic Compounds at pH=6.8 (Kd)	Henry's Law Constant at 25°C (HLC)	Air Diffusivity (D_i or D_a or D^{air})	Water Diffusivity (D_w)	Lower Explosive Limit in Air (LEL)	Flash Point (FP)	Water Solubility (S)	Physical State at Standard Temperature & Pressure	Molecular Weight (MW)
		L/Kg	L/Kg	atm-m^3/mol	cm^2/s	cm^2/s	unitless	°F	ug/L	unitless	g/mol
1,4-Dichlorobenzene	106467	NR	NR	2.43E-3	0.069	7.9E-6	0.025	150	73,800	Solid	147
3,3'-Dichlorobenzidine	91941	NR	NR	4.00E-9	0.0194	6.74E-6	NA	NA	3,110	Solid	253.1
Dichlorodifluoromethane	75718	NR	NR	2.60E+0	0.08	8.0E-6	NA	NA	3.00E+5	Liquid	120.91
1,1-Dichloroethane	75343	NR	NR	5.62E-3	0.0742	1.05E-5	0.054	2.0	5.06E+6	Liquid	98.96
1,2-Dichloroethane (I)	107062	NR	NR	9.79E-4	0.104	9.9E-6	0.062	56	8.52E+6	Liquid	98.97
1,1-Dichloroethylene (I)	75354	NR	NR	2.61E-2	0.09	1.04E-5	0.065	-2	2.25E+6	Liquid	96.94
cis-1,2-Dichloroethylene	156592	NR	NR	4.08E-3	0.0736	1.13E-5	0.056	36	3.50E+6	Liquid	96.94
trans-1,2-Dichloroethylene	156605	NR	NR	9.38E-3	0.0707	1.19E-5	0.056	36	6.30E+6	Liquid	96.94
2,6-Dichloro-4-nitroaniline	99309	NR	NR	4.67E-8	0.08	8.0E-6	NA	NA	7,000	Solid	207.02
2,4-Dichlorophenol	120832	147	NR	3.16E-6	0.0346	8.77E-6	NA	NA	4.50E+6	Liquid	163
2,4-Dichlorophenoxyacetic acid	94757	NR	NR	4.50E-6	0.059	6.5E-6	NA	NA	6.80E+5	Solid	221.04
1,2-Dichloropropane (I)	78875	NR	NR	2.80E-3	0.0782	8.73E-6	0.034	60	2.80E+6	Liquid	112.99
1,3-Dichloropropene	542756	NR	NR	1.77E-2	0.0626	1.0E-5	0.053	77	2.80E+6	Liquid	110.97
Dichlorovos	62737	NR	NR	9.58E-7	0.08	8.0E-6	NA	175	1.60E+7	Liquid	220.98
Dicyclohexyl phthalate	84617	NR	NR	7.61E-5	0.08	8.0E-6	NA	NA	4,000	Solid	330.43
Dieldrin	60571	NR	NR	1.51E-5	0.0125	4.74E-6	NA	NA	195	Solid	380.9
Diethyl ether	60297	NR	NR	8.70E-4	0.074	9.3E-6	0.019	-49	6.10E+7	Liquid	74.12
Diethyl phthalate	84662	NR	NR	4.50E-7	0.0256	6.35E-6	NA	322	1.08E+6	Liquid	222.23
Diethylene glycol monobutyl ether	112345	NR	NR	1.52E-9	0.08	8.0E-6	NA	NA	1.0E+9	Liquid	162.23
Diisopropyl ether	108203	NR	NR	1.3E-3	0.08	8.0E-6	0.014	-18	8,041	Liquid	102.18
Diisopropylamine (I)	108189	NR	NR	9.60E-5	0.08	8.0E-6	0.011	20	3.69E+7	Liquid	101.22

TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

Developed pursuant to R 299.5752 of the Administrative Rules for Part 201 Environmental Remediation of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Scientific notation is represented by E+ or E- a value, for example 200,000 is presented as 2.0E+5. Units are as indicated in each column heading. The dataset for each hazardous substance requires 22 columns. Review all 22 columns across 2 pages when evaluating data for a specific hazardous substance.

Hazardous Substance	Chemical Abstract Service Number	Oral Reference Dose (RFD)	Oral Slope Factor (SF)	Chronic Inhalation Reference Concentration (RfC)	Inhalation Unit Risk Factor (IURF)	Occupational Short Term Exposure Level (STEL)	Relative Source Contribution for Drinking Water (RSC)	Ingestion Absorption Efficiency (AEi)	Dermal Absorption Efficiency (AEd)	Relative Source Contribution for Soil (RSC)	Log Octanol-Water Partition Coefficient (Log Kow)	Soil Organic Carbon-Water Partition Coefficients for Organic Compounds (Koc)
		mg/Kg-day	$(mg/Kg\text{-}day)^{-1}$	ug/m^3	$(ug/m^3)^{-1}$	ug/m^3	unitless	unitless	unitless	unitless	unitless	L/Kg
Dimethyl phthalate	131113	1.0E+1	NA	5.0E+1	NA	NA	0.2	1.0	0.1	1.0	1.64	41.0
N,N-Dimethylacetamide	127195	2.5E-2	NA	NA	NA	NA	0.2	1.0	0.1	1.0	-0.77	0.175
N,N-Dimethylaniline	121697	2.2E-3	NA	NA	1.18E-5	5.0E+4	0.2	1.0	0.1	1.0	2.46	262
Dimethylformamide (I)	68122	9.6E-2	NA	3.0E+1	NA	NA	0.2	1.0	0.1	1.0	-1.01	0.102
2,4-Dimethylphenol	105679	5.0E-2	NA	7.0E+1	NA	NA	0.2	1.0	0.1	1.0	2.36	209
2,6-Dimethylphenol	576261	6.0E-4	NA	2E+0	NA	NA	0.2	1.0	0.1	1.0	2.36	209
3,4-Dimethylphenol	95658	1.4E-3	NA	3.5E+0	NA	NA	0.2	1.0	0.1	1.0	2.23	156
Dimethylsulfoxide	67685	3.0E+1	NA	2E+1	NA	NA	0.2	1.0	0.1	1.0	-1.66	0.0234
2,4-Dinitrotoluene	121142	2.0E-3	1.1E-1	2.0E+0	2.0E-4	NA	0.2	1.0	0.1	1.0	2.01	94.6
Dinoseb	88857	1.0E-3	NA	4E+0	NA	NA	0.2	1.0	0.1	1.0	3.15	1,250
1,4-Dioxane (I)	123911	NA	1.0E-2	100	5.5E-6	NA	0.2	1.0	0.1	1.0	-0.39	0.588
Diquat	85007	2.2E-3	NA	NA	NA	NA	0.2	1.0	0.1	1.0	-2.82	0.00169
Dissolved oxygen (DO)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diuron	330541	4.3E-3	NA	7.0E+0	NA	NA	0.2	1.0	0.1	1.0	2.77	187
Endosulfan (J)	115297	6.0E-3	NA	NA	NA	NA	0.2	1.0	0.1	1.0	4.1	2,110
Endothall	145733	1.7E-2	NA	3.5E+1	NA	NA	0.2	1.0	0.1	1.0	-0.55	0.288
Endrin	72208	1.7E-4	NA	NA	NA	NA	0.2	0.5	0.1	1.0	5.06	12,200
Epichlorohydrin (I)	106898	1.0E-3	5.9E-1	1.0E+0	1.2E-6	NA	0.2	1.0	0.1	1.0	0.26	1.92
Ethanol (I)	64175	6.2E+1	NA	1.9E+4	NA	NA	1.0	1.0	0.1	1.0	-0.31	0.496
Ethyl acetate (I)	141786	9.0E-1	NA	3.2E+3	NA	NA	0.2	1.0	0.1	1.0	0.69	4.77
Ethyl-tert-butyl ether (ETBE)	637923	NA	NA	3.73E+2	NA	NA	NA	1.0	0.1	1.0	1.92	3.97

Attachment 1
TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

Developed pursuant to R 299.5752 of the Administrative Rules for Part 201 Environmental Remediation of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Scientific notation is represented by E+ or E- a value, for example 200,000 is presented as 2.0E+5. Units are as indicated in each column heading. The dataset for each hazardous substance requires 22 columns. Review all 22 columns across 2 pages when evaluating data for a specific hazardous substance.

Hazardous Substance	Chemical Abstract Service Number	Soil Koc for Ionizing Organic Compounds at pH=6.8	Soil-Water Distribution Coefficients for Inorganic Compounds at pH=6.8 (Kd)	Henry's Law Constant at 25°C (HLC)	Air Diffusivity (D_i or D_a or D^{air})	Water Diffusivity (D_w)	Lower Explosive Limit in Air (LEL)	Flash Point (FP)	Water Solubility (S)	Physical State at Standard Temperature & Pressure	Molecular Weight (MW)
		L/Kg	L/Kg	atm-m^3/mol	cm^2/s	cm^2/s	unitless	°F	ug/L	unitless	g/mol
Dimethyl phthalate	131113	NR	NR	5.78E-7	0.067	6.3E-6	NA	295	4.19E+6	Liquid	194.19
N,N-Dimethylacetamide	127195	NR	NR	1.31E-8	0.08	8.0E-6	NA	158	1.0E+9	Liquid	87.14
N,N-Dimethylaniline	121697	NR	NR	8.12E-5	0.08	8.0E-6	NA	142	1.27E+6	Liquid	121.18
Dimethylformamide (I)	68122	NR	NR	7.39E-8	0.08	8.0E-6	NA	136	1.0E+9	Liquid	73.1
2,4-Dimethylphenol	105679	NR	NR	2.0E-6	0.0584	8.69E-6	NA	NA	7.87E+6	Solid	122.16
2,6-Dimethylphenol	576261	NR	NR	5.02E-6	0.08	8.0E-6	NA	NA	6.14E+6	Solid	122.16
3,4-Dimethylphenol	95658	NR	NR	3.78E-7	0.08	8.0E-6	NA	NA	4.93E+6	Solid	122.16
Dimethylsulfoxide	67685	NR	NR	5.80E-8	0.08	8.0E-6	NA	NA	1.66E+8	Liquid	78.14
2,4-Dinitrotoluene	121142	NR	NR	9.26E-8	0.203	7.06E-6	NA	NA	2.70E+5	Solid	183.15
Dinoseb	88857	NR	NR	4.60E-7	0.08	8.0E-6	NA	NA	52,000	Liquid	240.2
1,4-Dioxane (I)	123911	NR	NR	4.90E-6	0.23	1.0E-5	0.02	55	9.00E+8	Liquid	88.11
Diquat	85007	NR	NR	1.42E-13	0.08	8.0E-6	NA	NA	7.00E+5	Solid	344.08
Dissolved oxygen (DO)	NA	NR	NA	NR	NA	NA	NA	NA	NA	NA	NA
Diuron	330541	NR	NR	2.70E-6	0.08	8.0E-6	NA	NA	37,300	Solid	233.1
Endosulfan (J)	115297	NR	NR	1.12E-5	0.0115	4.55E-6	NA	NA	510	Solid	406.9
Endothall	145733	NR	NR	2.60E-10	0.08	8.0E-6	NA	NA	1.00E+8	Solid	186.18
Endrin	72208	NR	NR	7.52E-6	0.0125	4.74E-6	NA	NA	250	Solid	380.9
Epichlorohydrin (I)	106898	NR	NR	3.00E-5	0.086	9.8E-6	0.038	93	6.60E+7	Liquid	92.53
Ethanol (I)	64175	NR	NR	6.29E-6	0.08	8.0E-6	0.033	55	1.0E+9	Liquid	46.07
Ethyl acetate (I)	141786	NR	NR	1.70E-4	0.073	9.7E-6	0.02	24	6.40E+7	Liquid	88.12
Ethyl-tert-butyl ether (ETBE)	637923	NR	NR	1.389E-3	0.08	8.0E-6	NA	NA	5.63E+6	Liquid	102.18

DEQ

Attachment 1
TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

Developed pursuant to R 299.5752 of the Administrative Rules for Part 201 Environmental Remediation of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Scientific notation is represented by E+ or E- a value, for example 200,000 is presented as 2.0E+5. Units are as indicated in each column heading. The dataset for each hazardous substance requires 22 columns. Review all 22 columns across 2 pages when evaluating data for a specific hazardous substance.

Hazardous Substance	Chemical Abstract Service Number	Oral Reference Dose (RFD)	Oral Slope Factor (SF)	Chronic Inhalation Reference Concentration (RfC)	Inhalation Unit Risk Factor (IURF)	Occupational Short Term Exposure Level (STEL)	Relative Source Contribution for Drinking Water (RSC)	Ingestion Absorption Efficiency (AEi)	Dermal Absorption Efficiency (AEd)	Relative Source Contribution for Soil (RSC)	Log Octanol-Water Partition Coefficient (Log Kow)	Soil Organic Carbon-Water Partition Coefficients for Organic Compounds (Koc)
		mg/Kg-day	$(mg/Kg\text{-}day)^{-1}$	ug/m^3	$(ug/m^3)^{-1}$	ug/m^3	unitless	unitless	unitless	unitless	unitless	L/Kg
Ethylbenzene (I)	100414	9.7E-2	NA	1.0E+3	3.1E-7	5.43E+5	0.2	1.0	0.1	1.0	3.14	367
Ethylene dibromide	106934	NA	5.7E+1	9E+0	2.2E-4	NA	0.2	1.0	0.1	1.0	1.75	52.5
Ethylene glycol	107211	2.0E+0	NA	1.0E+3	NA	1.0E+5	0.2	1.0	0.1	1.0	-1.4	0.0421
Ethylene glycol monobutyl ether	111762	5.0E-1	NA	1.3E+4	NA	NA	0.2	1.0	0.1	1.0	0.83	6.55
Fluoranthene	206440	1.2E-1	NA	1.4E+2	NA	NA	0.2	0.5	0.1	1.0	5.12	1.08E+05
Fluorene	86737	1.2E-1	NA	1.4E+2	NA	NA	0.2	1.0	0.1	1.0	4.21	13,800
Fluorine (soluble fluoride) (B)	7782414	6.0E-2	NA	NA	NA	3.1E+3	1.0	0.5	0.01	1.0	NR	NR
Formaldehyde	50000	1.8E-1	NA	NA	1.3E-5	3.7E+2	0.2	1.0	0.1	1.0	-0.051	1.09
Formic acid (I,U)	64186	1.4E+0	NA	2.0E+0	NA	1.9E+4	0.2	1.0	0.1	1.0	-0.538	0.449
1-Formylpiperidine	2591868	1.1E-2	NA	NA	NA	NA	0.2	1.0	0.1	1.0	NA	NA
Gentian violet	548629	1.4E-1	5.5E-2	NA	NA	NA	0.2	1.0	0.1	1.0	0.51	3.17
Glyphosate	1071836	1.0E-1	NA	NA	NA	NA	0.2	0.5	0.1	1.0	-4.47	4.04E-5
Heptachlor	76448	2.3E-3	1.6E+0	NA	1.3E-3	NA	0.2	0.5	0.1	1.0	6.26	1.43E+6
Heptachlor epoxide	1024573	8.5E-6	2.9E+0	NA	2.6E-3	NA	0.2	0.5	0.1	1.0	5.0	82,300
n-Heptane	142825	4.4E+0	NA	3.5E+3	NA	2.05E+6	0.2	1.0	0.1	1.0	4.72	43,700
Hexabromobenzene	87821	2.8E-3	NA	NA	NA	NA	0.2	0.5	0.1	1.0	6.1	9.92E+5
Hexachlorobenzene (C-66)	118741	8.0E-4	1.0E+0	NA	4.6E-4	NA	0.2	0.5	0.1	1.0	5.89	55,300
Hexachlorobutadiene (C-46)	87683	2.0E-3	5.2E-2	NA	2.2E-5	NA	0.2	1.0	0.1	1.0	4.81	53,500
alpha-Hexachlorocyclohexane	319846	NA	2.0E+0	NA	1.83E-3	NA	0.2	1.0	0.1	1.0	3.8	1,220
beta-Hexachlorocyclohexane	319857	NA	9.7E-1	NA	5.3E-4	NA	0.2	1.0	0.1	1.0	3.81	1,250
Hexachlorocyclopentadiene (C-56)	77474	6.0E-3	NA	2.0E-1	NA	NA	0.2	0.5	0.1	1.0	5.39	1.99E+05

Attachment 1
TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

Developed pursuant to R 299.5752 of the Administrative Rules for Part 201 Environmental Remediation of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Scientific notation is represented by E+ or E- a value, for example 200,000 is presented as 2.0E+5. Units are as indicated in each column heading. The dataset for each hazardous substance requires 22 columns. Review all 22 columns across 2 pages when evaluating data for a specific hazardous substance.

Hazardous Substance	Chemical Abstract Service Number	Soil Koc for Ionizing Organic Compounds at pH=6.8	Soil-Water Distribution Coefficients for Inorganic Compounds at pH=6.8 (Kd)	Henry's Law Constant at 25°C (HLC)	Air Diffusivity (D_i or D_a or D^{air})	Water Diffusivity (D_w)	Lower Explosive Limit in Air (LEL)	Flash Point (FP)	Water Solubility (S)	Physical State at Standard Temperature & Pressure	Molecular Weight (MW)
		L/Kg	L/Kg	atm-m^3/mol	cm^2/s	cm^2/s	unitless	°F	ug/L	unitless	g/mol
Ethylbenzene (I)	100414	NR	NR	7.88E-3	0.075	7.8E-6	0.008	55	1.69E+5	Liquid	106.17
Ethylene dibromide	106934	NR	NR	4.60E-4	0.08	8.0E-6	NA	NA	4.20E+6	Liquid	187.9
Ethylene glycol	107211	NR	NR	6.00E-8	0.08	8.0E-6	0.032	232	1.0E+9	Liquid	62.07
Ethylene glycol monobutyl ether	111762	NR	NR	5.13E-2	0.08	8.0E-6	NA	143	2.24E+8	Liquid	118.2
Fluoranthene	206440	NR	NR	1.61E-5	0.0302	6.35E-6	NA	NA	206	Solid	202.24
Fluorene	86737	NR	NR	6.36E-5	0.0363	7.88E-6	NA	NA	1,980	Solid	166.23
Fluorine (soluble fluoride) (B)	7782414	NR	NA	NR	NR	NR	NA	NA	NA	Inorganic	38
Formaldehyde	50000	NR	NR	2.80E-4	0.18	2.0E-5	0.07	NA	5.50E+8	Liquid	30.03
Formic acid (I,U)	64186	NR	NR	2.50E-6	0.079	1.4E-6	0.18	122	1.0E+9	Liquid	46.03
1-Formylpiperidine	2591868	NR	NR	NA	0.08	8.0E-6	NA	NA	NA	Liquid	113.2
Gentian violet	548629	NR	NR	3.06E-16	0.08	8.0E-6	NA	NA	1.00E+6	Solid	408
Glyphosate	1071836	NR	NR	1.50E-9	0.08	8.0E-6	NA	NA	1.16E+7	Solid	169.09
Heptachlor	76448	NR	NR	1.48E-3	0.0112	5.69E-6	NA	NA	180	Solid	373.4
Heptachlor epoxide	1024573	NR	NR	9.50E-6	0.0132	4.23E-6	NA	NA	200	Solid	389.32
n-Heptane	142825	NR	NR	2.11E+0	0.08	8.0E-6	0.0105	25	2,690	Liquid	100.2
Hexabromobenzene	87821	NR	NR	1.30E-5	0.08	8.0E-6	NA	NA	0.17	Solid	551
Hexachlorobenzene (C-66)	118741	NR	NR	1.32E-3	0.0542	5.91E-6	NA	NA	6,200	Solid	284.78
Hexachlorobutadiene (C-46)	87683	NR	NR	8.15E-3	0.0561	6.16E-6	NA	NA	3,230	Liquid	260.76
alpha-Hexachlorocyclohexane	319846	NR	NR	1.06E-5	0.0142	7.34E-6	NA	NA	2,000	Solid	290.82
beta-Hexachlorocyclohexane	319857	NR	NR	7.43E-7	0.0142	7.34E-6	NA	NA	240	Solid	290.82
Hexachlorocyclopentadiene (C-56)	77474	NR	NR	2.70E-2	0.0161	7.21E-6	NA	NA	1,800	Liquid	272.77

Attachment 1
TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

Developed pursuant to R 299.5752 of the Administrative Rules for Part 201 Environmental Remediation of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Scientific notation is represented by E+ or E- a value, for example 200,000 is presented as 2.0E+5. Units are as indicated in each column heading. The dataset for each hazardous substance requires 22 columns. Review all 22 columns across 2 pages when evaluating data for a specific hazardous substance.

Hazardous Substance	Chemical Abstract Service Number	Oral Reference Dose (RFD)	Oral Slope Factor (SF)	Chronic Inhalation Reference Concentration (RfC)	Inhalation Unit Risk Factor (IURF)	Occupational Short Term Exposure Level (STEL)	Relative Source Contribution for Drinking Water (RSC)	Ingestion Absorption Efficiency (AEi)	Dermal Absorption Efficiency (AEd)	Relative Source Contribution for Soil (RSC)	Log Octanol-Water Partition Coefficient (Log Kow)	Soil Organic Carbon-Water Partition Coefficients for Organic Compounds (Koc)
		mg/Kg-day	$(mg/Kg-day)^{-1}$	ug/m^3	$(ug/m^3)^{-1}$	ug/m^3	unitless	unitless	unitless	unitless	unitless	L/Kg
Hexachloroethane	67721	1.0E-3	8.5E-3	3.5E+0	4.0E-6	NA	0.2	1.0	0.1	1.0	4.0	1,760
n-Hexane	110543	4.1E-1	NA	2.0E+2	NA	NA	0.2	1.0	0.1	1.0	4.0	1,760
2-Hexanone	591786	1.4E-1	NA	4.0E+1	NA	NA	0.2	1.0	0.1	1.0	1.4	23.8
Indeno(1,2,3-cd)pyrene (Q)	193395	NA	4.1E-1	NA	NA	NA	0.2	0.5	0.13	1.0	6.65	3.45E+6
Iron (B)	7439896	3.0E-1	NA	NA	NA	NA	0.2	0.5	0.01	1.0	NR	NR
Isobutyl alcohol (I)	78831	3.2E-1	NA	1.5E+3	NA	NA	0.2	1.0	0.1	1.0	0.75	5.46
Isophorone	78591	1.5E-1	1.1E-3	2.8E+2	2.7E-7	2.8E+4	0.2	1.0	0.1	1.0	1.699	46.8
Isopropyl alcohol (I)	67630	6.4E-2	NA	2.2E+2	NA	1.23E+6	0.2	1.0	0.1	1.0	0.05	1.31
Isopropyl benzene	98828	1.1E-1	NA	8.7E+1	NA	NA	0.2	1.0	0.1	1.0	3.6	3,460
Lead (B)	7439921	NA	NA	1.5E+0	NA	NA	0.2	0.5	0.01	1.0	NR	NR
Lindane	58899	3.3E-4	7.1E-1	NA	NA	NA	0.2	1.0	0.04	1.0	3.73	1,080
Lithium (B)	7439932	2.8E-2	NA	NA	NA	NA	0.2	0.5	0.01	1.0	NR	NR
Magnesium (B)	7439954	1.1E+1	NA	1.0E+2	NA	NA	1.0	0.5	0.01	1.0	NR	NR
Manganese (B)	7439965	4.7E-2	NA	5.0E-2	NA	NA	0.5	0.5	0.01	1.0	NR	NR
Mercury (Total) (B,Z)	Varies	3.0E-4	NA	3.0E-1	NA	NA	0.2	0.5	0.01	1.0	5.95	NR
Methane	74828	NA	NA	NA	NA	NA	0.2	1.0	0.1	1.0	1.09	11.8
Methanol	67561	5.0E-1	NA	3.25E+3	NA	3.28E+6	0.2	1.0	0.1	1.0	-0.72	0.196
Methoxychlor	72435	5.0E-3	NA	NA	NA	NA	0.2	0.5	0.1	1.0	5.08	12,600
2-Methoxyethanol (I)	109864	1.0E-3	NA	2.0E+1	NA	NA	0.2	1.0	0.1	1.0	-0.77	0.175
2-Methyl-4-chlorophenoxyacetic acid	94746	1.0E-3	NA	NA	NA	NA	0.2	1.0	0.1	1.0	3.25	1,570
2-Methyl-4,6-dinitrophenol	534521	3.5E-4	NA	NA	NA	NA	0.2	1.0	0.1	1.0	2.1	116

Attachment 1
TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

Developed pursuant to R 299.5752 of the Administrative Rules for Part 201 Environmental Remediation of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Scientific notation is represented by E+ or E- a value, for example 200,000 is presented as 2.0E+5. Units are as indicated in each column heading. The dataset for each hazardous substance requires 22 columns. Review all 22 columns across 2 pages when evaluating data for a specific hazardous substance.

Hazardous Substance	Chemical Abstract Service Number	Soil Koc for Ionizing Organic Compounds at pH=6.8	Soil-Water Distribution Coefficients for Inorganic Compounds at pH=6.8 (Kd)	Henry's Law Constant at 25°C (HLC)	Air Diffusivity (D_i or D_a or D^{air})	Water Diffusivity (D_w)	Lower Explosive Limit in Air (LEL)	Flash Point (FP)	Water Solubility (S)	Physical State at Standard Temperature & Pressure	Molecular Weight (MW)
		L/Kg	L/Kg	atm-m^3/mol	cm^2/s	cm^2/s	unitless	°F	ug/L	unitless	g/mol
Hexachloroethane	67721	NR	NR	3.89E-3	0.0025	6.8E-6	NA	NA	50,000	Solid	236.74
n-Hexane	110543	NR	NR	1.40E-2	0.08	8.0E-6	0.011	-7	12,000	Liquid	86.18
2-Hexanone	591786	NR	NR	9.57E-5	0.08	8.0E-6	NA	77	1.60E+7	Liquid	100.16
Indeno(1,2,3-cd)pyrene (Q)	193395	NR	NR	1.60E-6	0.019	5.66E-6	NA	NA	0.022	Solid	276.34
Iron (B)	7439896	NR	NA	NR	NR	NR	NA	NA	NA	Inorganic	55.845
Isobutyl alcohol (I)	78831	NR	NR	1.30E-5	0.08	8.0E-6	NA	82	7.60E+7	Liquid	74.14
Isophorone	78591	NR	NR	6.20E-6	0.0623	6.76E-6	0.008	184	1.20E+7	Liquid	138.23
Isopropyl alcohol (I)	67630	NR	NR	8.07E-6	0.08	8.0E-6	0.02	53	1.0E+9	Liquid	60.09
Isopropyl benzene	98828	NR	NR	1.50E-2	0.086	7.1E-6	0.009	96	56,000	Liquid	122.16
Lead (B)	7439921	NR	11,000	NR	NR	NR	NA	NA	NA	Inorganic	207.2
Lindane	58899	NR	NR	1.40E-5	0.0176	7.34E-6	NA	NA	6,800	Solid	290.9
Lithium (B)	7439932	NR	NA	NR	NR	NR	NA	NA	NA	Inorganic	6.941
Magnesium (B)	7439954	NR	NA	NR	NR	NR	NA	NA	NA	Inorganic	24.305
Manganese (B)	7439965	NR	NA	NR	NR	NR	NA	NA	NA	Inorganic	54.938
Mercury (Total) (B,Z)	Varies	NR	52	7.10E-10	0.037	6.3E-6	NA	NA	56	Inorganic	200.59
Methane	74828	NR	NR	6.58E-1	0.08	8.0E-6	0.053	-306	NA	Gas	16.04
Methanol	67561	NR	NR	1.70E-4	0.15	1.3E-5	0.06	52	2.90E+7	Liquid	32.05
Methoxychlor	72435	NR	NR	1.58E-5	0.0156	4.46E-6	NA	NA	45	Solid	345.7
2-Methoxyethanol (I)	109864	NR	NR	9.51E-7	0.08	8.0E-6	NA	NA	1.0E+9	Liquid	76.1
2-Methyl-4-chlorophenoxyacetic acid	94746	NR	NR	1.33E-9	0.08	8.0E-6	NA	NA	9.24E+5	Solid	305.79
2-Methyl-4,6-dinitrophenol	534521	NR	NR	4.30E-7	0.08	8.0E-6	NA	NA	2.00E+5	Solid	198.13

Attachment 1
TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

Developed pursuant to R 299.5752 of the Administrative Rules for Part 201 Environmental Remediation of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Scientific notation is represented by E+ or E- a value, for example 200,000 is presented as 2.0E+5. Units are as indicated in each column heading. The dataset for each hazardous substance requires 22 columns. Review all 22 columns across 2 pages when evaluating data for a specific hazardous substance.

Hazardous Substance	Chemical Abstract Service Number	Oral Reference Dose (RFD)	Oral Slope Factor (SF)	Chronic Inhalation Reference Concentration (RfC)	Inhalation Unit Risk Factor (IURF)	Occupational Short Term Exposure Level (STEL)	Relative Source Contribution for Drinking Water (RSC)	Ingestion Absorption Efficiency (AEi)	Dermal Absorption Efficiency (AEd)	Relative Source Contribution for Soil (RSC)	Log Octanol-Water Partition Coefficient (Log Kow)	Soil Organic Carbon-Water Partition Coefficients for Organic Compounds (Koc)
		mg/Kg-day	$(mg/Kg\text{-}day)^{-1}$	ug/m^3	$(ug/m^3)^{-1}$	ug/m^3	unitless	unitless	unitless	unitless	unitless	L/Kg
N-Methyl-morpholine (I)	109024	2.7E-3	NA	NA	NA	NA	0.2	1.0	0.1	1.0	-0.33	0.474
Methyl parathion	298000	2.5E-4	NA	NA	NA	NA	0.2	1.0	0.1	1.0	2.9	710
4-Methyl-2-pentanone (MIBK) (I)	108101	2.5E-1	NA	2.05E+3	NA	3.07E+6	0.2	1.0	0.1	1.0	1.18	14.5
Methyl-tert-butyl ether (MTBE)	1634044	3.3E-2	3.4E-3	3.0E+3	NA	NA	0.2	1.0	0.1	1.0	0.99	9.41
Methylcyclopentane (I)	96377	NA	NA	700	NA	NA	0.2	1.0	0.1	1.0	3.37	2,060
4,4'-Methylene-bis-2-chloroaniline (MBOCA)	101144	7.3E-4	7.7E-1	NA	3.7E-5	NA	0.2	1.0	0.1	1.0	3.92	7,140
Methylene chloride	75092	5.8E-2	4.2E-3	NA	4.7E-7	NA	0.2	1.0	0.1	1.0	1.26	11.9
2-Methylnaphthalene	91576	3.6E-2	NA	1E+1	NA	NA	0.2	1.0	0.1	1.0	3.9	6,820
Methylphenols (J)	1319773	5.0E-2	NA	1.0E+2	NA	NA	0.2	1.0	0.1	1.0	1.99	45.1
Metolachlor	51218452	2.3E-1	3.5E-3	NA	NA	NA	0.2	1.0	0.1	1.0	3.13	361
Metribuzin	21087649	2.5E-2	NA	NA	NA	NA	0.2	0.5	0.1	1.0	1.7	46.9
Mirex	2385855	2.3E-4	9.3E-1	NA	NA	NA	0.2	0.5	0.1	1.0	6.70	3.86E+6
Molybdenum (B)	7439987	5.0E-3	NA	NA	NA	NA	0.4	0.5	0.01	1.0	NR	NR
Naphthalene	91203	7.1E-2	NA	3.0E+0	3.1E-6	7.9E+4	0.2	1.0	0.1	1.0	3.36	2,010
Nickel (B)	7440020	7.6E-2	NA	NA	2.4E-4	NA	0.2	0.5	0.01	1.0	NR	NR
Nitrate (B,N)	14797558	1.6E+0	NA	NA	NA	NA	1.0	0.5	0.01	1.0	NR	NR
Nitrite (B,N)	14797650	1.0E-1	NA	NA	NA	NA	1.0	0.5	0.01	1.0	NR	NR
Nitrobenzene (I)	98953	4.6E-4	NA	7.0E-1	2.0E-5	NA	0.2	1.0	0.1	1.0	1.84	64.4
2-Nitrophenol	88755	2.8E-3	NA	NA	NA	NA	0.2	1.0	0.1	1.0	1.8	58.8
n-Nitroso-di-n-propylamine	621647	2.5E-1	4.5E+0	NA	2.0E-3	NA	0.2	1.0	0.1	1.0	1.4	23.8
N-Nitrosodiphenylamine	86306	2.5E-1	3.1E-3	NA	1.4E-6	NA	0.2	1.0	0.1	1.0	3.16	381

Attachment 1
TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

Developed pursuant to R 299.5752 of the Administrative Rules for Part 201 Environmental Remediation of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Scientific notation is represented by E+ or E- a value, for example 200,000 is presented as 2.0E+5. Units are as indicated in each column heading. The dataset for each hazardous substance requires 22 columns. Review all 22 columns across 2 pages when evaluating data for a specific hazardous substance.

Hazardous Substance	Chemical Abstract Service Number	Soil Koc for Ionizing Organic Compounds at pH=6.8	Soil-Water Distribution Coefficients for Inorganic Compounds at pH=6.8 (Kd)	Henry's Law Constant at 25°C (HLC)	Air Diffusivity (D_i or D_a or D^{air})	Water Diffusivity (D_w)	Lower Explosive Limit in Air (LEL)	Flash Point (FP)	Water Solubility (S)	Physical State at Standard Temperature & Pressure	Molecular Weight (MW)
		L/Kg	L/Kg	atm-m^3/mol	cm^2/s	cm^2/s	unitless	°F	ug/L	unitless	g/mol
N-Methyl-morpholine (I)	109024	NR	NR	2.50E-7	0.08	8.0E-6	NA	NA	1.0E+9	Liquid	101.17
Methyl parathion	298000	NR	NR	1.10E-7	0.08	8.0E-6	NA	NA	50,000	Solid	263.23
4-Methyl-2-pentanone (MIBK) (I)	108101	NR	NR	1.20E-4	0.075	7.8E-6	NA	64	2.00E+7	Liquid	100.2
Methyl-tert-butyl ether (MTBE)	1634044	NR	NR	6.39E-4	0.08	8.0E-6	NA	NA	4.68E+7	Liquid	88.15
Methylcyclopentane (I)	96377	NR	NR	3.63E-1	0.08	8.0E-6	NA	NA	73,890	Liquid	84.16
4,4'-Methylene-bis-2-chloroaniline (MBOCA)	101144	NR	NR	4.10E-11	0.08	8.0E-6	NA	NA	14,000	Solid	267.17
Methylene chloride	75092	NR	NR	2.40E-3	0.101	1.17E-5	0.13	NA	1.70E+7	Liquid	50.5
2-Methylnaphthalene	91576	NR	NR	4.99E-4	0.08	8.0E-6	NA	NA	24,600	Solid	142.2
Methylphenols (J)	1319773	NR	NR	1.60E-6	0.074	8.3E-6	NA	178	2.80E+7	Solid	108.13
Metolachlor	51218452	NR	NR	9.90E-9	0.08	8.0E-6	NA	NA	5.30E+5	Liquid	283.83
Metribuzin	21087649	NR	NR	8.80E-2	0.08	8.0E-6	NA	NA	1.2E+6	Solid	214.29
Mirex	2385855	NR	NR	5.16E-4	0.08	8.0E-6	NA	NA	6.8E-6	Solid	545.54
Molybdenum (B)	7439987	NR	NA	NR	NR	NR	NA	NA	NA	Inorganic	95.94
Naphthalene	91203	NR	NR	4.83E-4	0.059	7.5E-6	0.009	174	31,000	Solid	128.17
Nickel (B)	7440020	NR	65	NR	NR	NR	NA	NA	NA	Inorganic	58.7
Nitrate (B,N)	14797558	NR	NA	NR	NR	NR	NA	NA	NA	Inorganic	62
Nitrite (B,N)	14797650	NR	NA	NR	NR	NR	NA	NA	NA	Inorganic	46
Nitrobenzene (I)	98953	NR	NR	2.40E-5	0.076	8.6E-6	NA	190	2.09E+6	Liquid	123.11
2-Nitrophenol	88755	NR	NR	3.50E-6	0.08	8.0E-6	NA	NA	2.50E+6	Solid	139.11
n-Nitroso-di-n-propylamine	621647	NR	NR	2.25E-6	0.0545	8.17E-6	NA	NA	9.89E+6	Liquid	130.22
N-Nitrosodiphenylamine	86306	NR	NR	5.00E-6	0.0312	6.35E-6	NA	NA	35,100	Solid	198.22

Attachment 1

TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

Developed pursuant to R 299.5752 of the Administrative Rules for Part 201 Environmental Remediation of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Scientific notation is represented by E+ or E- a value, for example 200,000 is presented as 2.0E+5. Units are as indicated in each column heading. The dataset for each hazardous substance requires 22 columns. Review all 22 columns across 2 pages when evaluating data for a specific hazardous substance.

Hazardous Substance	Chemical Abstract Service Number	Oral Reference Dose (RFD)	Oral Slope Factor (SF)	Chronic Inhalation Reference Concentration (RfC)	Inhalation Unit Risk Factor (IURF)	Occupational Short Term Exposure Level (STEL)	Relative Source Contribution for Drinking Water (RSC)	Ingestion Absorption Efficiency (AEi)	Dermal Absorption Efficiency (AEd)	Relative Source Contribution for Soil (RSC)	Log Octanol-Water Partition Coefficient (Log Kow)	Soil Organic Carbon-Water Partition Coefficients for Organic Compounds (Koc)
		mg/Kg-day	(mg/Kg-day)$^{-1}$	ug/m^3	(ug/m^3)$^{-1}$	ug/m^3	unitless	unitless	unitless	unitless	unitless	L/Kg
Oxamyl	23135220	3.8E-2	NA	NA	NA	NA	0.2	1.0	0.1	1.0	-0.47	0.508
Oxo-hexyl acetate	88230357	1.0E-2	NA	3.1E+1	NA	NA	0.2	1.0	0.1	1.0	NA	NA
Pendimethalin	40487421	1.2E-1	NA	NA	NA	NA	0.2	0.5	0.1	1.0	5.18	1.24E+5
Pentachlorobenzene	608935	8.3E-4	NA	NA	NA	NA	0.2	0.5	0.1	1.0	5.26	1.48E+5
Pentachloronitrobenzene	82688	7.5E-3	NA	5.0E+0	NA	NA	0.2	1.0	0.1	1.0	4.64	36,400
Pentachlorophenol	87865	3.0E-2	6.8E-2	1.0E+2	3.0E-5	NA	0.2	0.5	0.25	1.0	5.09	592
Pentane	109660	NA	NA	1.8E+4	NA	2.21E+6	0.2	1.0	0.1	1.0	3.42	2,300
2-Pentene (I)	109682	NA	NA	NA	NA	NA	0.2	1.0	0.1	1.0	2.58	344
pH	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NR
Phenanthrene	85018	7.1E-3	NA	1.0E-1	NA	NA	0.2	1.0	0.1	1.0	4.6	33,300
Phenol	108952	6.0E-1	NA	6.0E+2	NA	NA	0.2	1.0	0.1	1.0	1.48	17.8
Phosphorus (Total)	7723140	1.1E+1	NA	1E+0	NA	NA	0.2	0.5	0.1	1.0	NR	NA
Phthalic acid	88993	1.9E+0	NA	NA	NA	NA	0.2	1.0	0.1	1.0	0.73	5.22
Phthalic anhydride	85449	2.1E+0	NA	NA	NA	NA	0.2	1.0	0.1	1.0	1.6	37.4
Picloram	1918021	7.0E-2	NA	NA	NA	NA	0.2	1.0	0.1	1.0	0.3	1.97
Piperidine	110894	4.4E-4	NA	1.4E+2	NA	NA	0.2	1.0	0.1	1.0	0.84	6.7
Polybrominated biphenyls (J)	67774327	4.3E-6	7.2E+0	NA	NA	NA	0.2	0.5	0.1	1.0	7.07	8.91E+6
Polychlorinated biphenyls (PCBs) (J,T)	1336363	2.0E-5	2.0E+0	NA	6.0E-4	NA	0.2	0.5	0.14	1.0	5.58	3.06E+5
Prometon	1610180	2.2E-2	NA	NA	NA	NA	0.2	1.0	0.1	1.0	2.99	870
Propachlor	1918167	1.3E-2	NA	NA	NA	NA	0.2	1.0	0.1	1.0	2.01	94.6
Propazine	139402	2.7E-2	NA	NA	NA	NA	0.2	1.0	0.1	1.0	2.75	505

Attachment 1
TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

Developed pursuant to R 299.5752 of the Administrative Rules for Part 201 Environmental Remediation of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Scientific notation is represented by E+ or E- a value, for example 200,000 is presented as 2.0E+5. Units are as indicated in each column heading. The dataset for each hazardous substance requires 22 columns. Review all 22 columns across 2 pages when evaluating data for a specific hazardous substance.

Hazardous Substance	Chemical Abstract Service Number	Soil Koc for Ionizing Organic Compounds at pH=6.8	Soil-Water Distribution Coefficients for Inorganic Compounds at pH=6.8 (Kd)	Henry's Law Constant at 25°C (HLC)	Air Diffusivity (D_i or D_a or D^{air})	Water Diffusivity (D_w)	Lower Explosive Limit in Air (LEL)	Flash Point (FP)	Water Solubility (S)	Physical State at Standard Temperature & Pressure	Molecular Weight (MW)
		L/Kg	L/Kg	atm-m^3/mol	cm^2/s	cm^2/s	unitless	°F	ug/L	unitless	g/mol
Oxamyl	23135220	NR	NR	2.37E-10	0.08	8.0E-6	NA	NA	2.80E+8	Solid	219.29
Oxo-hexyl acetate	88230357	NR	NR	NA	0.08	8.0E-6	NA	NA	NA	Liquid	144.2
Pendimethalin	40487421	NR	NR	8.56E-7	0.08	8.0E-6	NA	NA	275	Solid	281.31
Pentachlorobenzene	608935	NR	NR	8.40E-4	0.067	6.3E-6	NA	NA	650	Liquid	250.3
Pentachloronitrobenzene	82688	NR	NR	2.90E-2	0.08	8.0E-6	NA	NA	32	Solid	295.32
Pentachlorophenol	87865	592	NR	2.44E-8	0.056	6.1E-6	NA	NA	1.85E+6	Solid	266.32
Pentane	109660	NR	NR	1.26E+0	0.08	8.0E-6	0.015	-57	38,200	Liquid	72.15
2-Pentene (I)	109682	NR	NR	2.3E-1	0.08	8.0E-6	NA	NA	2.03E+5	Liquid	70.13
pH	NA	NR	NA	NR	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	85018	NR	NR	2.3E-5	0.08	8.0E-6	NA	NA	1,000	Solid	178.24
Phenol	108952	NR	NR	3.97E-7	0.082	9.1E-6	0.018	175	8.28E+7	Liquid	147.01
Phosphorus (Total)	7723140	NR	NR	NR	0.08	8.0E-6	NA	NA	NA	Solid	30.974
Phthalic acid	88993	NR	NR	2.18E-12	0.08	8.0E-6	NA	NA	1.42E+7	Liquid	166.13
Phthalic anhydride	85449	NR	NR	1.63E-8	0.08	8.0E-6	1.7E+7	305	6.2E+6	Liquid	148.1
Picloram	1918021	NR	NR	4.05E-11	0.08	8.0E-6	NA	NA	4.30E+5	Solid	241.48
Piperidine	110894	NR	NR	4.45E-6	0.08	8.0E-6	NA	NA	1.0E+9	Liquid	85.15
Polybrominated biphenyls (J)	67774327	NR	NR	3.90E-6	0.08	8.0E-6	NA	NA	1.66E+7	Solid	NA
Polychlorinated biphenyls (PCBs) (J,T)	1336363	NR	NR	4.20E-4	0.08	8.0E-6	NA	NA	44.7	Solid	268.4
Prometon	1610180	NR	NR	1.98E-9	0.08	8.0E-6	NA	NA	7.50E+5	Solid	225.29
Propachlor	1918167	NR	NR	1.09E-7	0.08	8.0E-6	NA	NA	6.55E+5	Solid	211.69
Propazine	139402	NR	NR	4.60E-9	0.08	8.0E-6	NA	NA	8,600	Solid	229.75

Attachment 1
TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

Developed pursuant to R 299.5752 of the Administrative Rules for Part 201 Environmental Remediation of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Scientific notation is represented by E+ or E- a value, for example 200,000 is presented as 2.0E+5. Units are as indicated in each column heading. The dataset for each hazardous substance requires 22 columns. Review all 22 columns across 2 pages when evaluating data for a specific hazardous substance.

Hazardous Substance	Chemical Abstract Service Number	Oral Reference Dose (RFD)	Oral Slope Factor (SF)	Chronic Inhalation Reference Concentration (RfC)	Inhalation Unit Risk Factor (IURF)	Occupational Short Term Exposure Level (STEL)	Relative Source Contribution for Drinking Water (RSC)	Ingestion Absorption Efficiency (AEi)	Dermal Absorption Efficiency (AEd)	Relative Source Contribution for Soil (RSC)	Log Octanol-Water Partition Coefficient (Log Kow)	Soil Organic Carbon-Water Partition Coefficients for Organic Compounds (Koc)
		mg/Kg-day	(mg/Kg-day)$^{-1}$ [1]	ug/m^3	(ug/m^3)$^{-1}$	ug/m^3	unitless	unitless	unitless	unitless	unitless	L/Kg
Propionic acid	79094	1.7E+0	NA	3.0E+2	NA	NA	0.2	1.0	0.1	1.0	0.28	1.89
Propyl alcohol (I)	71238	1.9E-1	NA	7.3E+2	NA	6.14E+5	0.2	1.0	0.1	1.0	0.25	1.89
n-Propylbenzene (I)	103651	1.1E-2	NA	2.0E+1	NA	NA	0.2	1.0	0.1	1.0	3.69	4,240
Propylene glycol	57556	2.0E+1	NA	6.0E+3	NA	NA	0.2	1.0	0.1	1.0	-0.92	0.125
Pyrene	129000	7.5E-2	NA	1.0E+2	NA	NA	0.2	0.5	0.1	1.0	5.11	1.06E+5
Pyridine (I)	110861	1.0E-3	NA	3.5E+0	NA	NA	0.2	1.0	0.1	1.0	0.67	4.56
Selenium (B)	7782492	5.0E-3	NA	2.0E+0	NA	NA	0.2	0.5	0.01	1.0	NR	NR
Silver (B)	7440224	4.7E-3	NA	1.0E-1	NA	NA	0.2	0.5	0.01	1.0	NR	NR
Silvex (2,4,5-TP)	93721	7.5E-3	NA	NA	NA	NA	0.2	1.0	0.1	1.0	3.4	2,200
Simazine	122349	5.2E-3	NA	NA	NA	NA	0.2	1.0	0.1	1.0	1.93	79.0
Sodium	17341252	3.4E+1	NA	NA	NA	NA	0.1	0.5	0.01	1.0	NR	NR
Sodium azide	26628228	1.2E-2	NA	NA	NA	NA	0.2	1.0	0.1	1.0	NA	NA
Strontium (B)	7440246	6.3E-1	NA	NA	NA	NA	0.2	0.5	0.01	1.0	NR	NR
Styrene	100425	2.0E-1	1.3E-2	1.0E+3	5.7E-7	1.7E+5	0.2	1.0	0.1	1.0	2.94	777
Sulfate	14808798	NA	NA	NA	NA	NA	NA	0.5	0.1	1.0	NR	NR
Tebuthiuron	34014181	7.0E-2	NA	NA	NA	NA	0.2	1.0	0.1	1.0	1.78	56.2
2,3,7,8-Tetrabromodibenzo-p-dic (O)	50585416	NA	7.5E+4	NA	NA	NA	0.2	0.5	0.03	1.0	7.24	1.31E+7
1,2,4,5-Tetrachlorobenzene	95943	3.4E-1	NA	1E+0	NA	NA	0.2	1.0	0.1	1.0	4.64	36,400
2,3,7,8-Tetrachlorodibenzo-p-dio (O)	1746016	NA	7.5E+4	NA	4.4E+1	NA	0.2	0.5	0.03	1.0	7.04	8.33E+6
1,1,1,2-Tetrachloroethane	630206	8.9E-2	1.1E-2	NA	7.4E-6	NA	0.2	1.0	0.1	1.0	2.63	145
1,1,2,2-Tetrachloroethane	79345	NA	1.0E-1	NA	5.8E-5	NA	0.2	1.0	0.1	1.0	2.39	93.5

Attachment 1
TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

Developed pursuant to R 299.5752 of the Administrative Rules for Part 201 Environmental Remediation of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Scientific notation is represented by E+ or E- a value, for example 200,000 is presented as 2.0E+5. Units are as indicated in each column heading. The dataset for each hazardous substance requires 22 columns. Review all 22 columns across 2 pages when evaluating data for a specific hazardous substance.

Hazardous Substance	Chemical Abstract Service Number	Soil Koc for Ionizing Organic Compounds at pH=6.8	Soil-Water Distribution Coefficients for Inorganic Compounds at pH=6.8 (Kd)	Henry's Law Constant at 25°C (HLC)	Air Diffusivity (D_i or D_a or D^{air})	Water Diffusivity (D_w)	Lower Explosive Limit in Air (LEL)	Flash Point (FP)	Water Solubility (S)	Physical State at Standard Temperature & Pressure	Molecular Weight (MW)
		L/Kg	L/Kg	atm-m^3/mol	cm^2/s	cm^2/s	unitless	°F	ug/L	unitless	g/mol
Propionic acid	79094	NR	NR	4.45E-7	0.08	8.0E-6	0.029	126	1.0E+9	Liquid	74.09
Propyl alcohol (I)	71238	NR	NR	7.41E-6	0.08	8.0E-6	0.022	72	1.0E+9	Liquid	60.11
n-Propylbenzene (I)	103651	NR	NR	NA	0.08	8.0E-6	NA	NA	NA	Liquid	120.19
Propylene glycol	57556	NR	NR	1.24E-8	0.08	8.0E-6	NA	NA	1.0E+9	Liquid	76.1
Pyrene	129000	NR	NR	1.10E-5	0.0272	7.24E-6	NA	NA	135	Solid	202.26
Pyridine (I)	110861	NR	NR	7.00E-3	0.091	7.6E-6	0.018	68	3.00E+5	Liquid	79.11
Selenium (B)	7782492	NR	5	NR	NR	NR	NA	NA	NA	Inorganic	78.96
Silver (B)	7440224	NR	8.3	NR	NR	NR	NA	NA	NA	Inorganic	107.868
Silvex (2,4,5-TP)	93721	NR	NR	1.30E-8	0.08	8.0E-6	NA	NA	1.40E+5	Solid	269.51
Simazine	122349	NR	NR	3.37E-9	0.08	8.0E-6	NA	NA	4,470	Solid	201.67
Sodium	17341252	NR	NA	NR	NR	NR	NA	NA	NA	Inorganic	23
Sodium azide	26628228	NR	NA	NA	0.08	8.0E-6	NA	NA	NA	Solid	65.01
Strontium (B)	7440246	NR	NA	NR	NA	NA	NA	NA	NA	Inorganic	87.62
Styrene	100425	NR	NR	2.75E-3	0.071	8.0E-6	0.009	88	3.10E+5	Liquid	104.15
Sulfate	14808798	NR	NA	NR	0.08	8.0E-6	NA	NA	NA	Inorganic	96.066
Tebuthiuron	34014181	NR	NR	2.40E-10	0.08	8.0E-6	NA	NA	2.50E+6	Solid	228.31
2,3,7,8-Tetrabromodibenzo-p-dic (O)	50585416	NR	NR	2.95E-7	0.08	8.0E-6	NA	NA	0.00996	Solid	499.6
1,2,4,5-Tetrachlorobenzene	95943	NR	NR	1.20E-3	0.08	8.0E-6	NA	NA	1,300	Solid	215.28
2,3,7,8-Tetrachlorodibenzo-p-dic (O)	1746016	NR	NR	9.20E-6	0.047	8.0E-6	NA	NA	0.019	Solid	322
1,1,1,2-Tetrachloroethane	630206	NR	NR	2.40E-3	0.071	7.9E-6	NA	NA	1.10E+6	Liquid	167.85
1,1,2,2-Tetrachloroethane	79345	NR	NR	3.45E-4	0.071	7.9E-6	NA	NA	2.97E+6	Liquid	167.85

Attachment 1

TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

Developed pursuant to R 299.5752 of the Administrative Rules for Part 201 Environmental Remediation of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Scientific notation is represented by E+ or E- a value, for example 200,000 is presented as 2.0E+5. Units are as indicated in each column heading. The dataset for each hazardous substance requires 22 columns. Review all 22 columns across 2 pages when evaluating data for a specific hazardous substance.

Hazardous Substance	Chemical Abstract Service Number	Oral Reference Dose (RFD)	Oral Slope Factor (SF)	Chronic Inhalation Reference Concentration (RfC)	Inhalation Unit Risk Factor (IURF)	Occupational Short Term Exposure Level (STEL)	Relative Source Contribution for Drinking Water (RSC)	Ingestion Absorption Efficiency (AEi)	Dermal Absorption Efficiency (AEd)	Relative Source Contribution for Soil (RSC)	Log Octanol-Water Partition Coefficient (Log Kow)	Soil Organic Carbon-Water Partition Coefficients for Organic Compounds (Koc)
		mg/Kg-day	$(mg/Kg\text{-}day)^{-1}$	ug/m^3	$(ug/m^3)^{-1}$	ug/m^3	unitless	unitless	unitless	unitless	unitless	L/Kg
Tetrachloroethylene	127184	1.0E-2	2.6E-2	NA	5.8E-7	6.85E+5	0.2	1.0	0.1	1.0	2.67	156
Tetrahydrofuran	109999	1.3E-2	NA	5.9E+3	2.0E-6	7.37E+5	0.2	1.0	0.1	1.0	0.46	2.83
Tetranitromethane	509148	NA	NA	4E-1	1.5E-2	NA	0.2	NA	NA	1.0	-2.05	9.66E-3
Thallium (B)	7440280	6.7E-5	NA	0.2	NA	NA	0.2	0.5	0.01	1.0	NR	NR
Toluene (I)	108883	2.2E-1	NA	4.0E+2	NA	NA	0.2	1.0	0.1	1.0	2.75	180
p-Toluidine	106490	NA	5.6E-2	NA	3.1E-5	NA	0.2	1.0	0.1	1.0	1.39	23.3
Total dissolved solids (TDS)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NR
Toxaphene	8001352	NA	4.4E-1	NA	3.2E-4	1.0E+3	0.2	0.5	0.1	1.0	5.5	2.55E+5
Triallate	2303175	1.3E-2	NA	NA	NA	NA	0.2	1.0	0.1	1.0	4.57	31,100
Tributylamine	102829	3.5E-3	NA	7.0E+0	NA	NA	0.2	1.0	0.1	1.0	4.46	24,200
1,2,4-Trichlorobenzene	120821	1.5E-2	NA	3.7E+2	NA	3.7E+4	0.2	1.0	0.1	1.0	4.01	1,790
1,1,1-Trichloroethane	71556	2.2E+0	NA	1.0E+3	NA	2.46E+6	0.2	1.0	0.1	1.0	2.48	110
1,1,2-Trichloroethane	79005	3.9E-3	2.9E-2	NA	1.6E-5	NA	0.2	1.0	0.1	1.0	2.05	50.3
Trichloroethylene	79016	1.7E-3	1.0E-2	NA	1.7E-6	5.37E+5	0.2	1.0	0.1	1.0	2.71	168
Trichlorofluoromethane	75694	3.5E-1	NA	5.62E+4	NA	5.62E+6	0.2	1.0	0.1	1.0	2.53	121
2,4,5-Trichlorophenol	95954	1.0E-1	NA	3.5E+2	NA	NA	0.2	1.0	0.1	1.0	3.9	1,597
2,4,6-Trichlorophenol	88062	NA	7.4E-3	NA	3.1E-6	NA	0.2	1.0	0.1	1.0	3.7	381
1,2,3-Trichloropropane	96184	5.7E-3	NA	0.3	NA	NA	0.2	1.0	0.1	1.0	2.26	167
1,1,2-Trichloro-1,2,2-trifluoroetha	76131	2.7E+1	NA	7.67E+4	NA	9.59E+6	0.2	1.0	0.1	1.0	3.15	1,250
Triethanolamine	102716	5.0E-1	NA	5.0E+1	NA	NA	0.2	1.0	0.1	1.0	-1.38	0.044
Triethylene glycol	112276	5.9E-1	NA	NA	NA	NA	0.2	1.0	0.1	1.0	-1.69	0.0218

Attachment 1
TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

Developed pursuant to R 299.5752 of the Administrative Rules for Part 201 Environmental Remediation of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Scientific notation is represented by E+ or E- a value, for example 200,000 is presented as 2.0E+5. Units are as indicated in each column heading. The dataset for each hazardous substance requires 22 columns. Review all 22 columns across 2 pages when evaluating data for a specific hazardous substance.

Hazardous Substance	Chemical Abstract Service Number	Soil Koc for Ionizing Organic Compounds at pH=6.8	Soil-Water Distribution Coefficients for Inorganic Compounds at pH=6.8 (Kd)	Henry's Law Constant at 25°C (HLC)	Air Diffusivity (D_i or D_i or D^{air})	Water Diffusivity (D_w)	Lower Explosive Limit in Air (LEL)	Flash Point (FP)	Water Solubility (S)	Physical State at Standard Temperature & Pressure	Molecular Weight (MW)
		L/Kg	L/Kg	atm-m^3/mol	cm^2/s	cm^2/s	unitless	°F	ug/L	unitless	g/mol
Tetrachloroethylene	127184	NR	NR	1.84E-2	0.072	8.2E-6	NA	NA	2.0E+5	Liquid	165.83
Tetrahydrofuran	109999	NR	NR	9.63E-3	0.08	8.0E-6	0.02	6.0	1.0E+9	Liquid	72.12
Tetranitromethane	509148	NR	NR	2.60E-5	0.08	8.0E-6	NA	NA	85,000	Liquid	196.03
Thallium (B)	7440280	NR	71	NR	NR	NR	NA	NA	NA	Inorganic	204.383
Toluene (I)	108883	NR	NR	6.64E-3	0.087	8.6E-6	0.011	40	5.26E+5	Liquid	92.14
p-Toluidine	106490	NR	NR	6.10E-6	0.08	8.0E-6	NA	188	7.60E+6	Liquid	107.17
Total dissolved solids (TDS)	NA	NR	NA	NR	NA	NA	NA	NA	NA	NA	NA
Toxaphene	8001352	NR	NR	6.00E-6	0.0116	4.34E-6	NA	NA	740	Solid	414
Triallate	2303175	NR	NR	1.93E-5	0.08	8.0E-6	NA	NA	4,000	Liquid	304.66
Tributylamine	102829	NR	NR	5.60E-3	0.08	8.0E-6	NA	NA	75,400	Liquid	185.4
1,2,4-Trichlorobenzene	120821	NR	NR	1.42E-3	0.03	8.23E-6	NA	222	3.00E+5	Liquid	181.45
1,1,1-Trichloroethane	71556	NR	NR	1.72E-2	0.078	8.8E-6	0.075	NA	1.33E+6	Liquid	133.4
1,1,2-Trichloroethane	79005	NR	NR	9.13E-4	0.078	8.8E-6	0.06	NA	4.42E+6	Liquid	133.4
Trichloroethylene	79016	NR	NR	1.03E-2	0.079	9.1E-6	0.08	NA	1.10E+6	Liquid	131.39
Trichlorofluoromethane	75694	NR	NR	1.3E-1	0.087	9.7E-6	NA	NA	1.10E+6	Liquid	137.38
2,4,5-Trichlorophenol	95954	1,597	NR	4.33E-6	0.0291	7.03E-6	NA	NA	1.20E+6	Solid	197.5
2,4,6-Trichlorophenol	88062	381	NR	7.79E-6	0.0318	6.25E-6	NA	NA	8.00E+5	Solid	197.5
1,2,3-Trichloropropane	96184	NR	NR	3.80E-4	0.071	7.9E-6	NA	160	1.90E+6	Liquid	147.43
1,1,2-Trichloro-1,2,2-trifluoroetha	76131	NR	NR	5.30E-1	0.078	8.2E-6	NA	NA	1.70E+5	Liquid	187.38
Triethanolamine	102716	NR	NR	3.38E-19	0.08	8.0E-6	NA	NA	1.0E+9	Liquid	149.19
Triethylene glycol	112276	NR	NR	2.61E-10	0.0427	8.06E-6	NA	NA	1.00E+6	Liquid	150.17

Attachment 1
TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;
PART 213 TIER 1 RISK-BASED SCREENING LEVELS (RBSLs)
DOCUMENT RELEASE DATE: MARCH 25, 2011

Developed pursuant to R 299.5752 of the Administrative Rules for Part 201 Environmental Remediation of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Scientific notation is represented by E+ or E- a value, for example 200,000 is presented as 2.0E+5. Units are as indicated in each column heading. The dataset for each hazardous substance requires 22 columns. Review all 22 columns across 2 pages when evaluating data for a specific hazardous substance.

Hazardous Substance	Chemical Abstract Service Number	Oral Reference Dose (RFD)	Oral Slope Factor (SF)	Chronic Inhalation Reference Concentration (RfC)	Inhalation Unit Risk Factor (IURF)	Occupational Short Term Exposure Level (STEL)	Relative Source Contribution for Drinking Water (RSC)	Ingestion Absorption Efficiency (AEi)	Dermal Absorption Efficiency (AEd)	Relative Source Contribution for Soil (RSC)	Log Octanol-Water Partition Coefficient (Log Kow)	Soil Organic Carbon-Water Partition Coefficients for Organic Compounds (Koc)
		mg/Kg-day	(mg/Kg-day)$^{-1}$	ug/m^3	(ug/m^3)$^{-1}$	ug/m^3	unitless	unitless	unitless	unitless	unitless	L/Kg
3-Trifluoromethyl-4-nitrophenol	88302	6.2E-1	NA	NA	NA	NA	0.2	1.0	0.1	1.0	2.87	663
Trifluralin	1582098	5.1E-3	4.5E-3	NA	NA	NA	0.2	0.5	0.1	1.0	5.3	1.62E+5
2,2,4-Trimethyl pentane	540841	NA	NA	3.5E+3	NA	NA	0.2	1.0	0.1	1.0	4.09	2,080
2,4,4-Trimethyl-2-pentene (I)	107404	NA	NA	NA	NA	NA	0.2	1.0	0.1	1.0	4.0	1,760
1,2,4-Trimethylbenzene (I)	95636	1.4E-1	NA	1.23E+3	NA	NA	0.2	1.0	0.1	1.0	3.67	965
1,3,5-Trimethylbenzene (I)	108678	1.4E-1	NA	1.23E+3	NA	NA	0.2	1.0	0.1	1.0	3.5	708
Triphenyl phosphate	115866	1.6E-1	NA	NA	NA	NA	0.2	1.0	0.1	1.0	4.67	39,000
tris(2,3-Dibromopropyl)phosphat	126727	NA	1.2E+0	NA	5.3E-4	NA	0.2	1.0	0.1	1.0	3.51	2,820
Urea	57136	NA	NA	NA	NA	NA	0.2	1.0	0.1	1.0	-2.11	0.0256
Vanadium	7440622	5.0E-3	NA	NA	NA	NA	0.2	0.5	0.01	1.0	NR	NR
Vinyl acetate (I)	108054	8.8E-2	NA	2.0E+2	NA	5.3E+4	0.2	1.0	0.1	1.0	0.73	5.22
Vinyl chloride	75014	3.0E-3	1.4E+0	1.0E+2	8.8E-6	NA	0.2	1.0	0.1	1.0	1.5	18.5
White phosphorus (R)	12185103	1.5E-5	NA	NA	NA	NA	0.2	0.5	0.01	1.0	NR	NR
Xylenes (I)	1330207	1.8E+0	NA	4.4E+3	NA	6.51E+5	0.2	1.0	0.1	1.0	3.11	348
Zinc (B)	7440666	3.3E-1	NA	NA	NA	NA	0.2	0.5	0.01	1.0	NR	NR

FOOTNOTES
for
Part 201 Criteria and Part 213 Risk-Based Screening Levels
Document Release Date: March 25, 2011

(A) Criterion is the state of Michigan drinking water standard established pursuant to Section 5 of 1976 PA 399, MCL 325.1005.

(B) Background, as defined in R 299.5701(b), may be substituted if higher than the calculated cleanup criterion. Background levels may be less than criteria for some inorganic compounds.

(C) Value presented is a screening level based on the chemical-specific generic soil saturation concentration (C_{sat}) since the calculated risk-based criterion is greater than C_{sat}. Concentrations greater than C_{sat} are acceptable cleanup criteria for this pathway where a site-specific demonstration indicates that free-phase material containing a hazardous substance is not present.

(D) Calculated criterion exceeds 100 percent, hence it is reduced to 100 percent or 1.0E+9 parts per billion (ppb).

(E) Criterion is the aesthetic drinking water value, as required by Section 20120a(5) of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). A notice of aesthetic impact may be employed as an institutional control mechanism if groundwater concentrations exceed the aesthetic drinking water criterion, but do not exceed the applicable health-based drinking water value provided in the following table:

Hazardous Substance	Chemical Abstract Service Number	Residential Health-Based Drinking Water Value	Non-Residential Health-Based Drinking Water Value
Aluminum	7429905	300	4,100
tertiary Amyl methyl ether	994058	910	2,600
Copper	7440508	1,400	4,000
Diethyl ether	60297	3,700	10,000
Ethylbenzene	100414	700	700
Iron	7439896	2,000	5,600
Manganese	7439965	860	2,500
Methyl-tert-butyl ether (MTBE)	1634044	240	690
Toluene	108883	1,000	1,000
1,2,4-Trimethylbenzene	95636	1,000	2,900
1,3,5-Trimethylbenzene	108678	1,000	2,900
Xylenes	1330207	10,000	10,000

(F) Criterion is based on adverse impacts to plant life and phytotoxicity.

(G) Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water. The final chronic value (FCV) for the protection of aquatic life shall be calculated based on the pH or hardness of the receiving surface water. Where water hardness exceeds 400 mg $CaCO_3$/L, use 400 mg $CaCO_3$/L for the FCV calculation. The FCV formula provides values in units of ug/L or ppb. The generic GSI criterion is the lesser of

the calculated FCV, the wildlife value (WV), and the surface water human non-drinking water value (HNDV). The soil GSI protection criteria for these hazardous substances are the greater of the 20 times the GSI criterion or the GSI soil-water partition values using the GSI criteria developed with the procedure described in this footnote.

Hazardous Substance	FCV Formula ug/L	FCV Conversion Factor (CF)	WV ug/L	HNDV ug/L
Acetate	EXP(0.2732*(pH) + 7.0362)	NA	NA	1.3E+6
Acetic Acid	EXP(0.2732*(pH) + 7.0362)	NA	NA	1.3E+6
Barium	EXP(1.0629*(LnH)+1.1869)	NA	NA	1.6E+5
Beryllium	EXP(2.5279*(LnH)-10.7689)	NA	NA	1,200
Cadmium⊘	(EXP(0.7852*(LnH)-2.715))*CF	1.101672-((LnH)*(0.041838))	NA	130
Chromium (III) ⊘	(EXP(0.819*(LnH)+0.6848))*CF	0.86	NA	9,400
Copper	(EXP(0.8545*(LnH)-1.702)) *CF	0.96	NA	38,000
Lead⊘	(EXP(1.273*(LnH)-3.296))*CF	1.46203-((LnH)*(0.14571))	NA	190
Manganese⊘	EXP(0.8784*(LnH)+3.5199)	NA	NA	59,000
Nickel	(EXP(0.846*(LnH)+0.0584))*CF	0.997	NA	2.1E+5
Pentachlorophenol⊘	EXP(1.005*(pH)-5.134)	NA	NA	2.8
Zinc	(EXP(0.8473*(LnH)+0.884))*CF	0.986	NA	16,000

where,

EXP(x) = The base of the natural logarithm raised to power x (e^x).
LnH = The natural logarithm of water hardness in mg $CaCO_3$/L.
* = The multiplication symbol.
⊘ = The GSI criterion developed here may not be protective for surface water that is used as a drinking water source. Refer to footnote (X) for further guidance.

A spreadsheet that may be used to calculate GSI and GSI protection criteria for (G)-footnoted hazardous substances is available on the Department of Environmental Quality (DEQ) internet web site.

(H) Valence-specific chromium data (Cr III and Cr VI) shall be compared to the corresponding valence-specific cleanup criteria. If both Cr III and Cr VI are present in groundwater, the total concentration of both cannot exceed the drinking water criterion of 100 ug/L. If analytical data are provided for total chromium only, they shall be compared to the cleanup criteria for Cr VI. Cr III soil cleanup criterion for protection of drinking water can only be used at sites where groundwater is prevented from being used as a public water supply, currently and in the future, through an approved land or resource use restriction.

(I) Hazardous substance may exhibit the characteristic of ignitability as defined in 40 C.F.R. §261.21 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at the DEQ, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of $45, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the DEQ, Remediation and Redevelopment Division (RRD), 525 West Allegan Street, Lansing, Michigan 48933, at cost.

(J) Hazardous substance may be present in several isomer forms. Isomer-specific concentrations shall be added together for comparison to criteria.

(K) Hazardous substance may be flammable or explosive, or both.

(L) Criteria for lead are derived using a biologically based model, as allowed for under Section 20120a(10) of the NREPA, and are not calculated using the algorithms and assumptions specified in pathway-specific rules. The generic residential drinking water criterion of 4 ug/L is linked to the generic residential soil direct contact criterion of 400 mg/kg. A higher concentration in the drinking water, up to the state action level of 15 ug/L, may be allowed as a site-specific remedy and still allow for drinking water use, under Section 20120a(2) of the NREPA if soil concentrations are appropriately lower than 400 mg/kg. If a site-specific criterion is approved based on this subdivision, a notice shall be filed on the deed for all property where the groundwater concentrations will exceed 4 ug/L to provide notice of the potential for unacceptable risk if soil or groundwater concentrations increase. Acceptable combinations of site-specific soil and drinking water concentrations are presented in the following table:

Acceptable Combinations of Lead in Drinking Water and Soil

Drinking Water Concentration (ug/L)	Soil Concentration (mg/kg)
5	386-395
6	376-385
7	376-385
8	366-375
9	356-365
10	346-355
11	336-345
12	336-345
13	326-335
14	316-325
15	306-315

(M) Calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.

(N) The concentrations of all potential sources of nitrate-nitrogen (e.g., ammonia-N, nitrite-N, nitrate-N) in groundwater that is used as a source of drinking water shall not, when added together, exceed the nitrate drinking water criterion of 10,000 ug/L. Where leaching to groundwater is a relevant pathway, soil concentrations of all potential sources of nitrate-nitrogen shall not, when added together, exceed the nitrate drinking water protection criterion of 2.0E+5 ug/kg.

(O) The concentration of all polychlorinated and polybrominated dibenzodioxin and dibenzofuran isomers present at a facility, expressed as an equivalent concentration of 2,3,7,8-tetrachlorodibenzo-p-dioxin based upon their relative potency, shall be added together and compared to the criteria for 2,3,7,8-tetrachlorodibenzo-p-dioxin. The generic cleanup criteria for 2,3,7,8-tetrachlorodibenzo-p-dioxin are not calculated according to the algorithms presented in R 299.5714 to R 299.5726. The generic cleanup criteria are being held at the values that the DEQ has used since August 1998, in recognition of

the fact that national efforts to reassess risks posed by dioxin are not yet complete. Until these studies are complete, it is premature to select a revised slope factor and/or reference dose for calculation of generic cleanup criteria.

(P) Amenable cyanide methods or method OIA-1677 shall be used to quantify cyanide concentrations for compliance with all groundwater criteria. Total cyanide methods or method OIA-1677 shall be used to quantify cyanide concentrations for compliance with soil criteria. Nonresidential direct contact criteria may not be protective of the potential for release of hydrogen cyanide gas. Additional land or resource use restrictions may be necessary to protect for the acute inhalation concerns associated with hydrogen cyanide gas.

(Q) Criteria for carcinogenic polycyclic aromatic hydrocarbons were developed using relative potential potencies to benzo(a)pyrene.

(R) Hazardous substance may exhibit the characteristic of reactivity as defined in 40 C.F.R. §261.23 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at the DEQ, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of $45, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the DEQ, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost.

(S) Criterion defaults to the hazardous substance-specific water solubility limit.

(T) Refer to the federal Toxic Substances Control Act (TSCA), 40 C.F.R. §761, Subpart D and 40 C.F.R. §761, Subpart G, to determine the applicability of TSCA cleanup standards. Subpart D and Subpart G of 40 C.F.R. §761 (July 1, 2001) are adopted by reference in these rules and are available for inspection at the DEQ, 525 West Allegan Street, Lansing, Michigan. Copies of the regulations may be purchased, at a cost as of the time of adoption of these rules of $55, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401, or from the DEQ, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost. Alternatives to compliance with the TSCA standards listed below are possible under 40 C.F.R. §761 Subpart D. New releases may be subject to the standards identified in 40 C.F.R. §761, Subpart G. Use Part 201 soil direct contact cleanup criteria in the following table if TSCA standards are not applicable.

Land Use Category	TSCA, Subpart D Cleanup Standards	Part 201 Soil Direct Contact Cleanup Criteria
Residential	1,000 ppb, or 10,000 ppb if capped	4,000 ppb
Nonresidential	1,000 ppb, or 10,000 ppb if capped	16,000 ppb

(U) Hazardous substance may exhibit the characteristic of corrosivity as defined in 40 C.F.R. §261.22 (revised as of July 1, 2001), which is adopted by reference in

these rules and is available for inspection at the DEQ, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of $45, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the DEQ, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost.

(V) Criterion is the aesthetic drinking water value as required by Section 20120(a)(5) of the NREPA. Concentrations up to 200 ug/L may be acceptable, and still allow for drinking water use, as part of a site-specific cleanup under Section 20120a(2) of the NREPA.

(W) Concentrations of trihalomethanes in groundwater shall be added together to determine compliance with the Michigan drinking water standard of 80 ug/L. Concentrations of trihalomethanes in soil shall be added together to determine compliance with the drinking water protection criterion of 1,600 ug/kg.

(X) The GSI criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source. For a groundwater discharge to the Great Lakes and their connecting waters or discharge in close proximity to a water supply intake in inland surface waters, the generic GSI criterion shall be the surface water human drinking water value (HDV) listed in the table in this footnote, except for those HDV indicated with an asterisk. For HDV with an asterisk, the generic GSI criterion shall be the lowest of the HDV, the WV, and the calculated FCV. See formulas in footnote (G). Soil protection criteria based on the HDV shall be as listed in the table in this footnote, except for those values with an asterisk. Soil GSI protection criteria based on the HDV shall be as listed in the table in this footnote, except for those values with an asterisk. Soil GSI protection criteria for compounds with an asterisk shall be the greater of 20 times the GSI criterion or the GSI soil-water partition values using the GSI criteria developed with the procedure described in this footnote.

Hazardous Substance	Chemical Abstract Service Number	Surface Water Human Drinking Water Values (HDV) (ug/L)	Soil GSI Protection Criteria for HDV (ug/kg)
Acrylamide	79061	0.5 (M); 0.12	10
Alachlor	15972608	3.5	88
Antimony	7440360	2.0 (M); 1.7	1,200
Benzene	71432	12	240
Boron	7440428	1,900	38,000
Bromate	15541454	10 (M); 0.5	200
Butyl benzyl phthalate	85687	6.9	13,000
Cadmium	7440439	2.5*	*
Carbon tetrachloride	56235	5.6	110
Chloride	16887006	50,000	1.0E+6
Chloroethane	75003	170	3,400
Chromium (III)	16065831	120*	*
Cyanazine	21725462	2.0 (M); 0.93	200 (M); 40
1,2-Dichloroethane	107062	6.0	120
trans-1,2-Dichloroethylene	156605	470	9,400
1,2-Dichloropropane	78875	9.1	180
1,3-Dichloropropene	542756	3.3	100 (M); 66
N,N-Dimethylacetamide	127195	700	14,000
1,4-Dioxane	123911	34	680
Ethylene dibromide	106934	0.17	20 (M); 3.4
Ethylene glycol	107211	56,000	1.1E+6
Hexachloroethane	67721	5.3	310
Isophorone	78591	310	6,200
Isopropyl alcohol	67630	28,000	5.6E+5
Lead	7439921	14*	*
Manganese	7439965	1,300*	*
Methanol	67561	14,000	2.8E+5
Methyl-tert-butyl ether (MTBE)	1634044	100	2,000
Methylene chloride	75092	47	940
Molybdenum	7439987	120	2,400
Nitrobenzene	98953	4.7	330 (M); 94
Pentachlorophenol	87865	1.8*	*
Styrene	100425	20	530
1,2,4,5-Tetrachlorobenzene	95943	2.8	3,300
1,1,2,2-Tetrachloroethane	79345	3.2	64
Tetrachloroethylene	127184	11	220
Tetrahydrofuran	109999	350	7,000
Thallium	7440280	2.0 (M); 1.2	1,400
1,2,4-Trichlorobenzene	120821	80	4,700
1,1,2-Trichloroethane	79005	12	240
Trichloroethylene	79016	29	580
Vinyl chloride	75014	1.0 (M); 0.25	40 (M); 20

(Y) Source size modifiers shown in the following table shall be used to determine soil inhalation criteria for ambient air when the source size is not one-half acre. The modifier shall be multiplied by the generic soil inhalation criteria shown in the

table of generic cleanup criteria to determine the applicable criterion.

Source Size sq. feet or acres	Modifier
400 sq feet	3.17
1000 sq feet	2.2
2000 sq feet	1.76
1/4 acre	1.15
1/2 acre	1
1 acre	0.87
2 acre	0.77
5 acre	0.66
10 acre	0.6
32 acre	0.5
100 acre	0.43

(Z) Mercury is typically measured as total mercury. The generic cleanup criteria, however, are based on data for different species of mercury. Specifically, data for elemental mercury, chemical abstract service (CAS) number 7439976, serve as the basis for the soil volatilization to indoor air criteria, groundwater volatilization to indoor air, and soil inhalation criteria. Data for methyl mercury, CAS number 22967926, serve as the basis for the GSI criterion; and data for mercuric chloride, CAS number 7487947, serve as the basis for the drinking water, groundwater contact, soil direct contact, and the groundwater protection criteria. Comparison to criteria shall be based on species-specific analytical data only if sufficient facility characterization has been conducted to rule out the presence of other species of mercury.

(AA) Comparison to these criteria may take into account an evaluation of whether the hazardous substances are adsorbed to particulates rather than dissolved in water and whether filtered groundwater samples were used to evaluate groundwater.

(BB) The state drinking water standard for asbestos is in units of fibers per milliliter of water (f/mL) longer than 10 millimicrons. Soil concentrations of asbestos are determined by polarized light microscopy.

(CC) Groundwater: The generic GSI criteria are based on the toxicity of unionized ammonia (NH_3); the criteria are 29 ug/L and 53 ug/L for cold water and warm water surface water, respectively. As a result, the GSI criterion shall be compared to the percent of the total ammonia concentration in the groundwater that will become NH_3 in the surface water. This percent NH_3 is a function of the pH and temperature of the receiving surface water and can be estimated using the following table, taken from Emerson, et al., (Journal of the Fisheries Research Board of Canada, Volume 32(12):2382, 1975).

Percent NH_3 in Aqueous Ammonia Solutions for 0-30 °C and pH 6-10

Temp (°F)	Temp (°C)	pH 6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
32.0	0	0.00827	0.0261	0.0826	0.261	0.820	2.55	7.64	20.7	45.3
33.8	1	0.00899	0.0284	0.0898	0.284	0.891	2.77	8.25	22.1	47.3
35.6	2	0.00977	0.0309	0.0977	0.308	0.968	3.00	8.90	23.6	49.4
37.4	3	0.0106	0.0336	0.106	0.335	1.05	3.25	9.60	25.1	51.5
39.2	4	0.0115	0.0364	0.115	0.363	1.14	3.52	10.3	26.7	53.5
41.0	5	0.0125	0.0395	0.125	0.394	1.23	3.80	11.1	28.3	55.6
42.8	6	0.0136	0.0429	0.135	0.427	1.34	4.11	11.9	30.0	57.6
44.6	7	0.0147	0.0464	0.147	0.462	1.45	4.44	12.8	31.7	59.5
46.4	8	0.0159	0.0503	0.159	0.501	1.57	4.79	13.7	33.5	61.4
48.2	9	0.0172	0.0544	0.172	0.542	1.69	5.16	14.7	35.3	63.3
50.0	10	0.0186	0.0589	0.186	0.586	1.83	5.56	15.7	37.1	65.1
51.8	11	0.0201	0.0637	0.201	0.633	1.97	5.99	16.8	38.9	66.8
53.6	12	0.0218	0.0688	0.217	0.684	2.13	6.44	17.9	40.8	68.5
55.4	13	0.0235	0.0743	0.235	0.738	2.30	6.92	19.0	42.6	70.2
57.2	14	0.0254	0.0802	0.253	0.796	2.48	7.43	20.2	44.5	71.7
59.0	15	0.0274	0.0865	0.273	0.859	2.67	7.97	21.5	46.4	73.3
60.8	16	0.0295	0.0933	0.294	0.925	2.87	8.54	22.8	48.3	74.7
62.6	17	0.0318	0.101	0.317	0.996	3.08	9.14	24.1	50.2	76.1
64.4	18	0.0343	0.108	0.342	1.07	3.31	9.78	25.5	52.0	77.4
66.2	19	0.0369	0.117	0.368	1.15	3.56	10.5	27.0	53.9	78.7
68.0	20	0.0397	0.125	0.396	1.24	3.82	11.2	28.4	55.7	79.9
69.8	21	0.0427	0.135	0.425	1.33	4.10	11.9	29.9	57.5	81.0
71.6	22	0.0459	0.145	0.457	1.43	4.39	12.7	31.5	59.2	82.1
73.4	23	0.0493	0.156	0.491	1.54	4.70	13.5	33.0	60.9	83.2
75.2	24	0.0530	0.167	0.527	1.65	5.03	14.4	34.6	62.6	84.1
77.0	25	0.0569	0.180	0.566	1.77	5.38	15.3	36.3	64.3	85.1
78.8	26	0.0610	0.193	0.607	1.89	5.75	16.2	37.9	65.9	85.9
80.6	27	0.0654	0.207	0.651	2.03	6.15	17.2	39.6	67.4	86.8
82.4	28	0.0701	0.221	0.697	2.17	6.56	18.2	41.2	68.9	87.3
84.2	29	0.0752	0.237	0.747	2.32	7.00	19.2	42.9	70.4	88.3
86.0	30	0.0805	0.254	0.799	2.48	7.46	20.3	44.6	71.8	89.0

The generic approach for estimating NH_3 assumes a default pH of 8 and default temperatures of 68°F and 85°F for cold water and warm water surface water, respectively. The resulting percent NH_3 is 3.8 percent and 7.2 percent for cold water and warm water, respectively. This default percentage shall be multiplied by the total ammonia-nitrogen (NH_3-N) concentration in the groundwater and the resulting NH_3 concentration compared to the applicable GSI criterion. As an

alternative, the maximum pH and temperature data from the specific receiving surface water can be used to estimate, from the table in this footnote, a lower percent unionized ammonia concentration for comparison to the generic GSI.

Soil: The generic soil GSI protection criteria for unionized ammonia are 580 ug/kg and 1,100 ug/kg for cold water and warm water surface water, respectively.

(DD) Hazardous substance causes developmental effects. Residential direct contact criteria are protective of both prenatal and postnatal exposure. Nonresidential direct contact criteria are protective for a pregnant adult receptor.

(EE) The following are applicable generic GSI criteria as required by Section 20120a(15) of the NREPA.

Hazardous Substance	GSI (ug/L)	Notes
Phosphorus	1,000	Criteria applicable unless receiving water is a surface water that has a phosphorus waste load allocation or is an inland lake. In those cases, contact the department for applicable values.
Total dissolved solids (TDS)	5.0E+5	If TDS data are not available, the TDS criterion may be used a screening level for the sum of the concentrations of the following substances: Calcium, Chlorides, Iron, Magnesium, Potassium, Sodium, Sulfate.
Dissolved Oxygen (DO): Cold receiving waters Warm receiving waters	 ≥ 7,000 ≥ 5,000	Since a low level of DO can be harmful to aquatic life, the criterion represents a minimum level that on-site samples must exceed. This is in contrast to other criteria which represent "not to exceed" concentrations. DO criteria are not applicable if groundwater Carbonaceous Biochemical Oxygen Demand (CBOD) is less than 10,000 ug/L and groundwater ammonia concentration is less than 2,000 ug/L.

(FF) The chloride GSI criterion shall be 125 mg/l when the discharge is to surface waters of the state designated as public water supply sources or 50 mg/l when the discharge is to the Great Lakes or connecting waters. Chloride GSI criteria shall not apply for surface waters of the state that are not designated as a public water supply source, however, the total dissolved solids criterion is applicable.

(GG) Risk-based criteria are not available for methane due to insufficient toxicity data. An acceptable soil gas concentration (presented for both residential and nonresidential land uses) was derived utilizing 25 percent of the lower explosive level for methane. This equates to 1.25 percent or 8.4E+6 ug/m^3.

"ID" means insufficient data to develop criterion.
"NA" means a criterion or value is not available or, in the case of background and CAS numbers, not applicable.
"NLL" means hazardous substance is not likely to leach under most soil conditions.
"NLV" means hazardous substance is not likely to volatilize under most conditions.

Remediation and Redevelopment Division

Michigan Department of Environmental Quality

Interim Final – August 2, 2006

RRD OPERATIONAL MEMORANDUM NO. 4

SITE CHARACTERIZATION AND REMEDIATION VERIFICATION

ATTACHMENT 3 - SEDIMENTS

Key definitions for terms used in this document:

NREPA:	The Natural Resources and Environmental Protection Act, 1994 PA 451, as amended
Part 201:	Part 201, Environmental Remediation, of the NREPA
Part 213:	Part 213, Leaking Underground Storage Tanks, of the NREPA
MDEQ:	Michigan Department of Environmental Quality
RRD:	Remediation and Redevelopment Division
U.S.EPA:	United States Environmental Protection Agency
Benthic Community:	Aquatic organisms adapted for living near, on and within sediment
Bioaccumulative Chemicals:	Chemicals that tend to accumulate in the tissues of aquatic and terrestrial organisms as defined in R 323.1043(l) and Table 5 of R 323.1057
Contamination:	Includes hazardous substances that have been released and are present above criteria
Criteria or criterion:	Includes the cleanup criteria for Part 201 of the NREPA and the Risk Based Screening Levels as defined in Part 213 of the NREPA and R 299.5706a(4)
Facility:	Includes "facility" as defined by Part 201 of the NREPA and "site" as defined by Part 213 of the NREPA
Release:	Includes "release" as defined by both Part 201 and Part 213 of the NREPA
Sediment:	Particulate matter that exists at or has settled to the bottom in surface water bodies including those of intermittent streams, creeks, brooks, ditches, drains or wetlands
Surface Water:	Surface waters of the state as defined in R 323.1044(v) and R 323.1043(s)

TABLE OF CONTENTS

1.0 INTRODUCTION

The particulate matter that exists at, or has settled to the bottom in lakes, ponds, streams, wetlands, and other surface water bodies is called sediment. Sediment represents an essential element of aquatic ecosystems, providing nutrients and habitat for aquatic flora and fauna essential in the aquatic and aquatic-dependent food web. Contamination of sediments by a wide variety of toxic and bioaccumulative chemicals can negatively impact aquatic ecosystems, aquatic dependent wildlife (birds, reptiles and mammals) and human health. Many contaminants, which may be found in only trace amounts in the water column, can accumulate to elevated levels in sediments. Many of these, such as organochlorine pesticides and polychlorinated biphenyls may have been released long ago, but they continue to persist in the environment. In addition to being sinks for contaminants, sediments can also serve as potential sources of pollutants as conditions change in the receiving water system (such as periods of anoxia, inundation/scouring from severe storms or human activity).

At any Part 201 facility or Part 213 site at which surface waters or sediments have been contaminated or at which there is the potential for contamination to have reached surface waters or sediments, characterization of the nature and extent of contamination must address surface water sediments in accordance with R 299.5730, which requires:

> **Rule 730.** (1) Any remedial action plan that addresses surface water or sediments associated with waters of the state shall include site-specific cleanup criteria established by the department on the basis of sound scientific principles and evaluation of bulk sediment chemistry, sediment toxicity and benthic community populations. Criteria shall be established considering the need to eliminate or mitigate the following use impairments, as appropriate to the facility in question:
>
> (a) Restrictions on fish or wildlife consumption.
> (b) Tainting of fish and wildlife flavor.
> (c) Degraded fish or wildlife populations.
> (d) Fish tumors or other deformities.
> (e) Bird or animal deformities or reproductive problems.
> (f) Degradation of benthos.
> (g) Restrictions on dredging activities.
> (h) Eutrophication or undesirable algae.
> (i) Restrictions on drinking water consumption or taste or odor problems.
> (j) Beach closings.
> (k) Degradation of aesthetics.
> (l) Added costs to agriculture, industry, or a local unit of government.
> (m) Degradation of phytoplankton or zooplankton populations.
> (n) Loss of fish and wildlife habitat.
> (o) Unacceptable risk through human contact as a result of absorption of hazardous substances through the skin or by incidental ingestion of sediments.
> (p) Other unacceptable risks to human receptors exposed to hazardous substances in sediments.
>
> (2) The basis for, and information used by the department to develop, cleanup criteria under this rule shall be made available to the public upon request.

In addition to the required analysis of bulk sediment chemistry, sediment toxicity and benthic community populations, the characterization of nature and extent of contamination at a facility where sediment contamination is or may be present should include an assessment of the presence of any of the above-listed use impairments.

There are no generic sediment cleanup criteria. Due to the wide range of potential use impairments, development of site-specific sediment criteria may require addressing multiple exposure scenarios. Each may require different sampling strategies for criteria development and compliance for the protection of aquatic life, wildlife, human health and the ecosystem.

In order for the MDEQ to develop site-specific sediment cleanup criteria as required by R 299.5730(1) and provide the public information as required by R 299.5730(2), any proposal for response activities that includes the development of site-specific sediment criteria must be submitted to the RRD project manager for MDEQ review and approval.

2.0 CHARACTERIZATION

Proper characterization of sediment must determine the potential for contaminated sediments to result in violations of water quality standards (Section 20120a(15)) or use impairments specified in R 299.5730(1) and the nature and extent of contamination. Phasing the sediment characterization may be beneficial. Useful information on evaluating contaminated sediments can be found in U.S.EPA's *A Guidance Manual to Support the Assessment of Contaminated Sediments in Freshwater Ecosystems, Volumes I, II, and III*, December, 2002. (EPA-905-B02-001-A, B, and C). http://www.cerc.usgs.gov/pubs/sedtox/guidance_manual.htm.

2.1 Identification or confirmation of a release to sediments

Where it is suspected that sediment contamination is present, it may be advisable to conduct preliminary sampling to confirm whether there is any sediment contamination. Such initial sampling should be targeted to those areas where sediment contamination is likely to have concentrated. Such areas may include locations of groundwater contamination discharge; locations where contaminated soils, water, or waste materials entered the surface water body; and locations where fine grained materials tend to accumulate such as pools, backwaters, and the inner portions of river bends. Upstream locations, outside the impact area of the facility should also be sampled, to differentiate the impact of the facility from that of upgradient sources or background. Results from this preliminary sampling effort should be used only to evaluate the presence or absence of contamination. This preliminary sampling effort is not intended to provide sufficient information to evaluate the risk posed by contaminants or the need for further response activities where hazardous substance contamination is present.

2.2 Initial characterization of the nature and extent of sediment contamination

Where sediment contamination exists, a work plan must be prepared to determine the lateral and vertical extent of the hazardous substances contamination. Guidance for preparing a sediment sampling plan is available in U.S.EPA's *Methods for Collection, Storage, and Manipulation of Sediments for Chemical and Toxicological Analyses*: Technical Manual, October 2001. (EPA 823-B-01-002). http://www.epa.gov/waterscience/cs/collectionmanual.pdf
Where it is known that multiple sediment contaminants, significant "unknown" contaminants or

bioaccumulative contaminants are present, it may be prudent to conduct the sediment toxicity or bioaccumulation testing discussed in Section 2.3 below in the initial phase of characterization and include the results with the characterization report.

Because the results of this characterization will form the basis for development of site-specific sediment cleanup criteria by the MDEQ, the work plan must be submitted to the RRD project manager for MDEQ review and approval prior to implementation.

In the initial sediment evaluation phase, the analytical data can be compared to published sediment chemical quality guideline information, which are used as screening values for the potential that the presence of hazardous substances will cause water quality standards violations or any of the use impairments identified in R 299.5730(1). Chemical values for screening sediment chemical sampling results may be found in:

Appendix A:
U.S.EPA's *A Guidance Manual to Support the Assessment of Contaminated Sediments in Freshwater Ecosystems, Volumes III*, December, 2002, Tables 1 and 2. (EPA-905-B02-001-C). http://www.cerc.usgs.gov/pubs/sedtox/guidance_manual.htm.

Appendix B:
U.S.EPA, Region 5, *RCRA Ecological Screening Levels* http://www.epa.gov/RCRIS-Region-5/ca/ESL.pdf

Upon completion of the sediment characterization and comparison of the concentrations of contaminants to screening values, all of the sampling results and comparisons as well as identification of the presence any of the use impairments specified in R 299.5730(1) must be provided in a report to the RRD project manager. MDEQ staff will review the report to determine its approvability and whether additional sediment analysis and site specific sediment criteria development is necessary.

2.3 Sediment toxicity testing

If upon review of the sediment characterization report, the MDEQ determines that the sediment concentrations indicate the potential for toxicity to aquatic life and/or the bioaccumulation of sediment contaminants, appropriate sediment toxicity tests must be performed to determine whether violations of water quality standards may be occurring. A sediment toxicity sampling and analysis work plan must be submitted to the RRD project manager for prior MDEQ review and approval. Guidance for preparing an appropriate plan is available in the U.S. EPA's *Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates*, March 2000, EPA600/R-99/064. http://www.epa.gov/ost/cs/freshfact.html.

Upon completing the sediment toxicity sampling and analysis, a sediment toxicity and/or bioaccumulation report must be submitted to the RRD project manager. MDEQ staff will review this report to determine whether there is a potential water quality violation, and whether the development of site-specific sediment criteria is appropriate.

3.0 SITE-SPECIFIC SEDIMENT CRITERIA DEVELOPMENT

3.1 Development of site-specific sediment criteria for protection of aquatic life

If upon review, MDEQ determines that violations of water quality standards are likely to occur, site-specific sediment cleanup criteria will be developed by the MDEQ and documented along with the basis for the criteria. Response action(s) taken at a facility will need to address sediments that exceed site-specific cleanup criteria (Sec. 20118).

3.2 Development of site-specific sediment criteria for protection against other potential use impairments

Site-specific chemical criteria developed to protect aquatic life may not sufficiently address all potential use impairments. The MDEQ will: 1) determine if ecological risks for other than aquatic life need further evaluation; 2) assess the potential for unacceptable risk through human contact as a result of absorption of hazardous substances through the skin or by incidental ingestion of sediments; 3) determine whether additional review of use impairments may be necessary where there is no established basis for calculating numeric or qualitative criteria (e.g., aesthetics), or if conditions warrant further consideration to address Rule 730 elements. Where appropriate, site-specific sediment criteria will be developed to protect against such other potential use impairments.

4.0 Remediation

4.1 Presumptive remedy

Where after site characterization the nature and extent of sediment contamination above screening levels and any use impairments are well defined, and bioaccumulative contaminants are not an issue, it may be more cost effective or otherwise appropriate to proceed with remedy design and implementation to address contamination above the screening levels, rather than proceed with extensive toxicity testing and site-specific criteria development. Although screening levels would not be considered enforceable cleanup criteria, with the exception of bioaccumulative contaminants they would be protective and if they were met and any use impairments addressed, further response action to address sediment contamination would not be required.

4.2 Response action monitoring, and verification of remediation

Facilities with sediment contamination require significant planning for remediation, operation and maintenance, monitoring, and remedy verification. A monitoring plan should be developed and included in any plan for response action involving contaminated sediments. Things that need to be considered in a monitoring plan include:

- The media affected (e.g., sediment, surface water, floodplain soils, surface water, groundwater, biota);
- The variety of contaminants of concern and (potentially ongoing) sources of those contaminants;
- The area and ecological and physical conditions where remediation and monitoring will need to be performed;
- The spatial and temporal variability of sediments and biota to be monitored;
- The nature of the relationship between contaminant levels in sediment and biota; and

- At large facilities, the impact and effectiveness of multiple response actions across the facility.

In some situations nonnumeric parameters such as color or the presence of waste may need to be used to monitor the effectiveness of individual actions.

Physical, chemical and biological monitoring all may play a part in evaluation of the effectiveness of a response action. If remediation is designed for removal of sediments to a specific depth or some erosion-resistant surface (e.g., hardpan), bathymetric or geophysical surveys could be used to determine compliance with the design. Where response action is designed to meet specific concentration criteria, monitoring to assess the effectiveness of response action should include chemical concentrations in sediment, surface water or biota with comparison to cleanup criteria or to environmental and health standards. Verification of the effectiveness of response action may also need to include evaluation of any of the use impairments identified in R 299.5730(1) to assess improved conditions over time.

Response actions conducted to address contaminated sediments may require a variety of permits or compliance with the substantive requirements of the relevant permitting programs (e.g., State Part 301 permits for most sampling, dredging or containment activities in surface water bodies, Federal Section 404 permits for dredging and containment activities, NPDES permits for discharge from dewatering activities).

For further information regarding sediment remediation, operation and maintenance and remedy verification see, the U.S. EPA's *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites,* December, 2006 (EPA-540-R-05-012, OSWER 9355.0-85), http://www.epa.gov/superfund/resources/sediment/pdfs/guidance.pdf.

APPENDIX A

Tables 1 and 2, Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems

From U.S.EPA's *A Guidance Manual to Support the Assessment of Contaminated Sediments in Freshwater Ecosystems, Volumes III*, December, 2002. (EPA-905-B02-001-C). http://www.cerc.usgs.gov/pubs/sedtox/guidance_manual.htm .

Table 1. Sediment quality guidelines that reflect threshold effect concentrations (TECs; i.e., below which harmful effects are unlikely to be observed; from MacDonald *et al.* 2000b).

Substance	*Threshold Effect Concentrations*						
	TEL	LEL	MET	ERL	TEL-HA28	SQAL	Consensus-Based TEC
Metals (in mg/kg DW)							
Arsenic	5.9	6	7	33	11	NG	9.79
Cadmium	0.596	0.6	0.9	5	0.58	NG	0.99
Chromium	37.3	26	55	80	36	NG	43.4
Copper	35.7	16	28	70	28	NG	31.6
Lead	35	31	42	35	37	NG	35.8
Mercury	0.174	0.2	0.2	0.15	NG	NG	0.18
Nickel	18	16	35	30	20	NG	22.7
Zinc	123	120	150	120	98	NG	121
Polycyclic Aromatic Hydrocarbons (PAHs; in µg/kg DW)							
Anthracene	NG	220	NG	85	10	NG	57.2
Fluorene	NG	190	NG	35	10	540	77.4
Naphthalene	NG	NG	400	340	15	470	176
Phenanthrene	41.9	560	400	225	19	1800	204
Benz[a]anthracene	31.7	320	400	230	16	NG	108
Benzo(a)pyrene	31.9	370	500	400	32	NG	150
Chrysene	57.1	340	600	400	27	NG	166
Dibenz[a,h]anthracene	NG	60	NG	60	10	NG	33.0
Fluoranthene	111	750	600	600	31	6200	423
Pyrene	53	490	700	350	44	NG	195
Total PAHs	NG	4000	NG	4000	260	NG	1610

Table 1. Sediment quality guidelines that reflect threshold effect concentrations (TECs; i.e., below which harmful effects are unlikely to be observed; from MacDonald *et al.* 2000b).

Substance	*Threshold Effect Concentrations*						
	TEL	LEL	MET	ERL	TEL-HA28	SQAL	Consensus-Based TEC
Polychlorinated Biphenyls (PCBs; in µg/kg DW)							
Total PCBs	34.1	70	200	50	32	NG	59.8
Organochlorine Pesticides (in µg/kg DW)							
Chlordane	4.5	7	7	0.5	NG	NG	3.24
Dieldrin	2.85	2	2	0.02	NG	110	1.90
Sum DDD	3.54	8	10	2	NG	NG	4.88
Sum DDE	1.42	5	7	2	NG	NG	3.16
Sum DDT	NG	8	9	1	NG	NG	4.16
Total DDTs	7	7	NG	3	NG	NG	5.28
Endrin	2.67	3	8	0.02	NG	42	2.22
Heptachlor epoxide	0.6	5	5	NG	NG	NG	2.47
Lindane (gamma-BHC)	0.94	3	3	NG	NG	3.7	2.37

TEC = Threshold effect concentration (from MacDonald *et al.* 2000a).
TEL = Threshold effect level; dry weight (Smith *et al.* 1996).
LEL = Lowest effect level, dry weight (Persaud *et al.* 1993).
MET = Minimal effect threshold; dry weight (EC & MENVIQ 1992).
ERL = Effects range low; dry weight (Long and Morgan 1991).
TEL-HA28 = Threshold effect level for *Hyalella azteca*; 28 day test; dry weight (USEPA 1996).
SQAL = Sediment quality advisory levels; dry weight at 1% OC (USEPA 1997).
NG = No guideline; DW = dry weight.

Table 2. Sediment quality guidelines that reflect probable effect concentrations (PECs; i.e., above which harmful effects are likely to be observed; from MacDonald *et al.* 2000b).

Substance	*Probable Effect Concentrations*					
	PEL	SEL	TET	ERM	PEL-HA28	Consensus-Based PEC
Metals (in mg/kg DW)						
Arsenic	17	33	17	85	48	33.0
Cadmium	3.53	10	3	9	3.2	4.98
Chromium	90	110	100	145	120	111
Copper	197	110	86	390	100	149
Lead	91.3	250	170	110	82	128
Mercury	0.486	2	1	1.3	NG	1.06
Nickel	36	75	61	50	33	48.6
Zinc	315	820	540	270	540	459
Polycyclic Aromatic Hydrocarbons (PAHs; in µg/kg DW)						
Anthracene	NG	3700	NG	960	170	845
Fluorene	NG	1600	NG	640	150	536
Naphthalene	NG	NG	600	2100	140	561
Phenanthrene	515	9500	800	1380	410	1170
Benz[a]anthracene	385	14800	500	1600	280	1050
Benzo(a)pyrene	782	14400	700	2500	320	1450
Chrysene	862	4600	800	2800	410	1290
Fluoranthene	2355	10200	2000	3600	320	2230
Pyrene	875	8500	1000	2200	490	1520
Total PAHs	NG	100000	NG	35000	3400	22800
Polychlorinated Biphenyls (PCBs; in µg/kg DW)						
Total PCBs	277	5300	1000	400	240	676

Table 2. Sediment quality guidelines that reflect probable effect concentrations (PECs; i.e., above which harmful effects are likely to be observed; from MacDonald *et al.* 2000b).

Substance	*Probable Effect Concentrations*					
	PEL	SEL	TET	ERM	PEL-HA28	Consensus-Based PEC
Organochlorine Pesticides (in µg/kg DW)						
Chlordane	8.9	60	30	6	NG	17.6
Dieldrin	6.67	910	300	8	NG	61.8
Sum DDD	8.51	60	60	20	NG	28.0
Sum DDE	6.75	190	50	15	NG	31.3
Sum DDT	NG	710	50	7	NG	62.9
Total DDTs	4450	120	NG	350	NG	572
Endrin	62.4	1300	500	45	NG	207
Heptachlor Epoxide	2.74	50	30	NG	NG	16.0
Lindane (gamma-BHC)	1.38	10	9	NG	NG	4.99

PECs = probable effect concentrations (from MacDonald *et al.* 2000a)
PEL = Probable effect level; dry weight (Smith *et al.* 1996).
SEL = Severe effect level, dry weight (Persaud *et al.* 1993).
TET = Toxic effect threshold; dry weight (EC & MENVIQ 1992).
ERM = Effects range median; dry weight (Long and Morgan 1991).
PEL-HA28 = Probable effect level for *Hyalella azteca*; 28-day test; dry weight (USEPA 1996a).
NG = No guideline; DW = dry weight.

APPENDIX B

U.S.EPA, Region 5, RCRA Ecological Screening Levels, August 22, 2003

http://www.epa.gov/RCRIS-Region-5/ca/ESL.pdf

U.S. EPA, Region 5, RCRA Ecological Screening Levels August 22, 2003

Chemical	CAS No.	Air mg/m³	Water ug/l	Sediment[s] ug/kg	Soil[v] ug/kg
Acenaphthene	83-32-9		**38**[a]	6.71[r]	6.82 e+5
Acenaphthylene	208-96-8		4.84 e+3[b]	5.87[r]	6.82 e+5
Acetone	67-64-1	959	**1700**[a, c, z]	**9.9**[z]	2500[w]
Acetonitrile	75-05-8	17.1	**12 e+3**[d, z]	**56**[z]	1370[w]
Acetophenone	98-86-2		-----	-----	3 e+5
Acetylaminofluorene [2-]	53-96-3		535[b]	15.3	596
Acrolein	107-02-8	0.578	**0.19**[c, z]	**1.52 e-3**[z]	5270[w]
Acrylonitrile	107-13-1	0.797	**66**[a]	**1.2**	23.9[w]
Aldrin	309-00-2		**1.7 e-2**[a, z]	2[t]	3.32[x]
Allyl chloride	107-05-1	1.22		-----	13.4
Aminobiphenyl [4-]	92-67-1			-----	3.05
Aniline	62-53-3		**4.1**[d]	**0.31**	56.8[w]
Anthracene	120-12-7		**0.035**[f]	**57.2**[u]	1.48 e+6
Antimony (Total)	7440-36-0		**80**[c]		142
Aramite	140-57-8		3.09[g]	1.11 e-3	1.66 e+5
Arsenic (Total)	7440-38-2		**148**[f]	**9790**[u]	5700
Azobenzene [p-(dimethylamino)]	60-11-7		1.65[b]	318	40
Barium (Total)	7440-39-3		**220**[d, z]		1040
Benzene	71-43-2	9.76	114[f]	142	255
Benzo[a]anthracene	56-55-3		**0.025**[c, z]	**108**[u]	5210

U.S. EPA, Region 5, RCRA Ecological Screening Levels August 22, 2003

Chemical	CAS No.	Air mg/m^3	Water ug/l	Sediment[s] ug/kg	Soil[v] ug/kg
Benzo[a]pyrene	50-32-8		0.014[h]	**150**[u]	1520
Benzo[b]fluoranthene	205-99-2		9.07[b]	1.04 e+4	5.98 e+4
Benzo[ghi]perylene	191-24-2		7.64[b]	170[t]	1.19 e+5
Benzo[k]fluoranthene	207-8-9		-----	240[t]	1.48 e+5
Benzyl alcohol	100-51-6		**8.6**[h, z]	**1.04**[z]	6.58 e+4
Beryllium (Total)	7440-41-7		**3.6**[d, k, z]		1060
BHC [alpha-]	319-84-6		12.4[b]	6[t]	99.4
BHC [beta-]	319-85-7		0.495[b]	5[t]	3.98[x]
BHC [delta-]	319-86-8		667[g]	7.15 e+4	9940
BHC [gamma-]	58-89-9		**0.026**[a]	**2.37**[u]	5[x]
Bromodichloromethane	75-27-4			-----	540
Bromoform	75-25-2	9.11	**230**[d, z]	**492**[z]	1.59 e+4
Bromophenyl phenyl ether [4-]	101-55-3		1.5[h]	1550	
Butylamine [N-Nitrosodi-n-]	924-16-3		-----	-----	267
Butylbenzyl phthalate	85-68-7		**23**[d, z]	**1970**[z]	239
Cadmium (Total)	7440-43-9		**0.15**[i, j, k]	**990**[u]	2.22
Carbon disulfide	75-15-0	3.67	**15**[d, z]	**23.9**[z]	94.1
Carbon tetrachloride	56-23-5	1.41	**240**[d]	**1450**	2980
Chlordane	57-74-9		**4.3 e-3**[j]	**3.24**[u, z]	224[x]
Chlorethyl ether [bis(2-]	111-44-4		**19 e+3**[l]	**3520**	2.37 e+4[w]

Chemical	CAS No.	Air mg/m^3	Water ug/l	Sediment[s] ug/kg	Soil[v] ug/kg
Chloro-1-methylethyl)ether [bis(2-]	108-60-1		-----	-----	1.99 e+4
Chloroaniline [p-]	106-47-8		232[g]	146	1100
Chlorobenzene	108-90-7	120	**47**[a]	**291**	1.31 e+4
Chlorobenzilate	510-15-6		7.16[g]	860	5050
Chloroethane	75-0-3	20	-----	-----	
Chloroform	67-66-3	1.34	**140**[d]	**121**	1190
Chloronaphthalene [2-]	91-58-7		0.396[b]	417	12.2
Chlorophenol [2-]	95-57-8		**24**[a]	**31.9**	243
Chlorophenyl phenyl ether [4-]	7005-72-3			-----	
Chloroprene	126-99-8	4.16 E-2		-----	2.9
Chromium[+3] (Total)	7440-47-3		42[j, k]	**4.34 e+4**[u]	400[y]
Chrysene	218-1-9		-----	**166**[u]	4730
Cobalt (Total)	7440-48-4		**24**[d]	5.00 e+4[t]	140
Copper (Total)	7440-50-8		**1.58**[j, k, z]	**3.16 e+4**[u]	**5400**
Cresol [4,6-dinitro-o-]	534-52-1		**23**[m]	**104**	144
Cresol [m-]	108-39-4		**62**[d]	**52.4**	3490
Cresol [o-]	95-48-7		**67**[e]	**55.4**	4.04 e+4
Cresol [p-chloro-m-]	59-50-7		34.8[g]	388	7950
Cresol [p-]	106-44-5		**25**[a]	**20.2**	1.63 e+5
Cyanide	57-12-5		5.2[a]	0.1[t]	1330[w]

U.S. EPA, Region 5, RCRA Ecological Screening Levels August 22, 2003

Chemical	CAS No.	Air mg/m^3	Water ug/l	Sediment[s] ug/kg	Soil[v] ug/kg
DDD [4,4'-]	72-54-8		-----	**4.88**[u, z]	758
DDE [4,4'-]	72-55-9		4.51 e-9[e]	**3.16**[u]	596
DDT [4,4'-]	50-29-3		**1.1 e-5**[a, z]	**4.16**[u]	**3.5**[z]
Di-n-butyl phthalate	84-74-2		**9.7**[a]	**1114**	150
Di-n-octyl phthalate	117-84-0		30[f]	4.06 e+4	7.09 e+5
Diallate	2303-16-4		-----	-----	452[w]
Dibenzofuran	132-64-9		**4**[a, z]	**449**[z]	
Dibenz[a,h]anthracene	53-70-3		-----	**33**[u]	1.84 e+4
Dibromo-3-chloropropane [1,2-]	96-12-8	0.32	-----	-----	35.2
Dibromochloromethane	124-48-1		-----	-----	2050
Dibromoethane [1,2-]	106-93-4	176	-----	-----	1230
Dichloro-2-butene [trans-1,4-]	110-57-6	4.03		-----	
Dichlorobenzene [m-]	541-73-1	273	**38**[a, z]	**1315**[z]	3.77 e+4
Dichlorobenzene [o-]	95-50-1	270	**14**[h]	**294**	2960
Dichlorobenzene [p-]	106-46-7	275	**9.4**[d, z]	**318**[z]	546
Dichlorobenzidine [3,3'-]	91-94-1		**4.5**[a, z]	**127**	646
Dichlorodifluoromethane	75-71-8	1550		-----	3.95 e+4
Dichloroethane [1,1-]	75-34-3	1240	47[h]	0.575	2.01 e+4
Dichloroethane [1,2-]	107-6-2	29.7	**910**[h]	**260**	2.12 e+4
Dichloroethene [1,1-]	75-35-4	0.303	**65**[a, z]	**19.4**[z]	8280

Chemical	CAS No.	Air mg/m^3	Water ug/l	Sediment[s] ug/kg	Soil[v] ug/kg
Dichloroethylene [trans-1,2-]	156-60-5	29.1	**970**[d]	**654**	784
Dichlorophenol [2,4-]	120-83-2		**11**[d, z]	**81.7**[z]	8.75 e+4
Dichlorophenol [2,6-]	87-65-0			-----	1170
Dichloropropane [1,2-]	78-87-5	70.6	**360**[a, z]	**333**[z]	3.27 e+4
Dichloropropene [cis-1,3-]	10061-1-5	5.89	-----	-----	398
Dichloropropene [trans-1,3-]	10061-2-6	5.89	-----	-----	398
Dieldrin	60-57-1		**7.1 e-5**[a]	**1.9**[u, z]	2.38
Diethyl O-2-pyrazinyl phosphorothioate [O,O-]	297-97-2			-----	799
Diethyl phthalate	84-66-2		**110**[a]	**295**	2.48 e+4
Dimethoate	60-51-5		-----	-----	218
Dimethyl phthalate	131-11-3		-----	-----	7.34 e+5
Dimethylbenzidine [3,3'-]	119-93-7			-----	104
Dimethylbenz[a]anthracene [7,12-]	57-97-6		0.548[b]	6.64 e+4	1.63 e+4
Dimethylphenethylamine [alpha,alpha-]	122-9-8			-----	300
Dimethylphenol [2,4-]	105-67-9		100[b]	304	10[x]
Dinitrobenzene [m-]	99-65-0		**22**[d]	**8.61**	655
Dinitrophenol [2,4-]	51-28-5		**19**[a]	**6.21**	60.9
Dinitrotoluene [2,4-]	121-14-2		**44**[d, z]	**14.4**[z]	1280
Dinitrotoluene [2,6-]	606-20-2		**81**[d]	**39.8**	32.8

U.S. EPA, Region 5, RCRA Ecological Screening Levels August 22, 2003

Chemical	CAS No.	Air mg/m^3	Water ug/l	Sediment[s] ug/kg	Soil[v] ug/kg
Dinoseb	88-85-7		**0.48**[a]	**14.5**	21.8
Dioxane [1,4-]	123-91-1	367	**22 e+3**[a]	**119**	2050[w]
Diphenylamine	122-39-4		412[b]	34.6	1010
Disulfoton	298-4-4		4.02 e-2[c]	324	19.9
D [2,4-]	94-75-7		**220**[a]	**1273**	27.2
Endosulfan I	959-98-8		**0.056**[j]	**3.26**	119
Endosulfan II	33213-65-9		**0.056**[j]	**1.94**	119
Endosulfan sulfate	1031-7-8		2.22[b]	34.6	35.8
Endrin	72-20-8		**0.036**[a]	**2.22**[u,z]	10.1
Endrin aldehyde	7421-93-4		0.15[b]	**480**[z]	10.5
Ethyl methacrylate	97-63-2	356		-----	3 e+4
Ethyl methane sulfonate	62-50-0			-----	
Ethylbenzene	100-41-4	304	**14**[o,z]	**175**	5160
Famphur	52-85-7			-----	49.7
Fluoranthene	206-44-0		**1.9**[f,z]	**423**[u]	1.22 e+5
Fluorene	86-73-7		**19**[d]	**77.4**[u]	1.22 e+5
Heptachlor	76-44-8		**3.8 e-3**[j]	0.6[r]	5.98
Heptachlor epoxide	1024-57-3		**3.8 e-3**[j]	**2.47**[u]	152
Hexachlorobenzene	118-74-1		**3 e-4**[a]	20[t]	199
Hexachlorobutadiene	87-68-3		**0.053**[a,z]	**26.5**[z]	39.8

U.S. EPA, Region 5, RCRA Ecological Screening Levels August 22, 2003

Chemical	CAS No.	Air mg/m^3	Water ug/l	Sediment[c] ug/kg	Soil[y] ug/kg
Hexachlorocyclopentadiene	77-47-4		77[b]	901	755
Hexachloroethane	67-72-1		**8**[a, z]	**584**[z]	596
Hexachlorophene	70-30-4		0.228[e]	2.31 e+5	199
Hexachloropropene	1888-71-7		-----	-----	
Hexanone [2-]	591-78-6	105	**99**[h, z]	**58.2**[z]	1.26 e+4
Indeno (1,2,3-cd) pyrene	193-39-5		4.31[b]	200[f]	1.09 e+5
Isobutyl alcohol	78-83-1	32.8	-----	-----	2.08 e+4[w]
Isodrin	465-73-6		3.09 e-2[e]	55.2	3.32[x]
Isophorone	78-59-1		**920**[d]	**432**	1.39 e+5
Isosafrole	120-58-1			-----	9940
Kepone	143-50-0		0.132[e]	3.31	32.7
Lead (Total)	7439-92-1		**1.17**[j, k, z]	**3.58 e+4**[u]	53.7
Mercury (Total)	7439-97-6		1.3 e-3[a]	174[r]	100[y]
Methacrylonitrile	126-98-7	3.38		-----	57[w]
Methane [bis(2-chloroethoxy)]	111-91-1		-----	-----	302[w]
Methapyrilene	91-80-5			-----	2780[w]
Methoxychlor	72-43-5		**0.019**[h]	**13.6**	19.9
Methyl bromide	74-83-9	26.5	**16**[d]	**1.37**	235[w]
Methyl chloride	74-87-3	2.63		-----	1.04 e+4[w]
Methyl ethyl ketone	78-93-3	642	**2200**[a, z]	**42.4**[z]	8.96 e+4[w]

U.S. EPA, Region 5, RCRA Ecological Screening Levels August 22, 2003

Chemical	CAS No.	Air mg/m^3	Water ug/l	Sediment[s] ug/kg	Soil[v] ug/kg
Methyl iodide	74-88-4	11.7		-----	1230
Methyl mercury	22967-92-6		2.46 e-3[e]	0.01	1.58
Methyl methacrylate	80-62-6	87.1	2800[g]	168	9.84 e+5[w]
Methyl methanesulfanate	66-27-3			-----	315[w]
Methyl parathion	298-0-0			-----	0.292
Methyl-2-pentanone [4-]	108-10-1	45.9	**170**[h, z]	**25.1**[z]	4.43 e+5
Methylcholanthrene [3-]	56-49-5		8.91 e-2[b]	8.19 e+6	77.9
Methylene bromide	74-95-3	344		-----	6.5 e+4[w]
Methylene chloride	75-9-2	4780	**940**[a]	**159**[z]	4050[w]
Methylnaphthalene [2-]	91-57-6		330[b]	20.2[r]	3240
Naphthalene	91-20-3	80.1	**13**[a, z]	**176**[u]	99.4
Naphthoquinone [1,4-]	130-15-4		-----	-----	1670
Naphthylamine [1-]	134-32-7		-----	-----	9340
Naphthylamine [2-]	91-59-8			-----	3030
Nickel (Total)	7440-2-0		**28.9**[j, k, z]	**2.27 e+4**[u]	1.36 e+4
Nitroaniline [m-]	99-9-2			-----	3160
Nitroaniline [o-]	88-74-4			-----	7.41 e+4
Nitroaniline [p-]	100-1-6			-----	2.19 e+4
Nitrobenzene	98-95-3		**220**[a, z]	**145**[z]	1310
Nitrophenol [o-]	88-75-5		-----	-----	1600

U.S. EPA, Region 5, RCRA Ecological Screening Levels August 22, 2003

Chemical	CAS No.	Air mg/m^3	Water ug/l	Sediment[s] ug/kg	Soil[v] ug/kg
Nitrophenol [p-]	100-2-7		**60[a]**	**13.3**	5120
Nitroquinoline-1-oxide [4-]	56-57-5			-----	122
Nitrosodiethylamine [N-]	55-18-5		768[g]	22.8	69.3[w]
Nitrosodimethylamine [N-]	62-75-9			-----	0.0321[w]
Nitrosodiphenylamine [N-]	86-30-6		-----	-----	545
Nitrosomethylethylamine [N-]	10595-95-6			-----	1.66[w]
Nitrosomorpholine [N-]	59-89-2			-----	70.6[w]
Nitrosopiperidine [N-]	100-75-4			-----	6.65[w]
Nitrosopyrrolidine [N-]	930-55-2			-----	12.6[w]
Parathion	56-38-2		**0.013[a, d]**	**0.757**	0.34[y]
Pentachlorobenzene	608-93-5		**0.019[a, z]**	**24[z]**	497
Pentachloroethane	76-1-7	0.68	56.4[g]	689	1.07 e+4
Pentachloronitrobenzene	82-68-8		-----	-----	7090
Pentachlorophenol	87-86-5		**4.0[j, p, z]**	**2.3 e+4[z]**	119
Phenacetin	62-44-2		-----	-----	1.17 e+4
Phenanthrene	85-1-8		**3.6[f]**	**204[u]**	4.57 e+4
Phenol	108-95-2	4.31	**180[c]**	**49.1**	1.2 e+5
Phenylenediamine [p-]	106-50-3			-----	6160[w]
Phorate	298-02-2		3.62[g]	0.861	0.496
Phthalate [bis(2-ethylhexyl)]	117-81-7		**0.3[q, z]**	182[r]	925

U.S. EPA, Region 5, RCRA Ecological Screening Levels August 22, 2003

Chemical	CAS No.	Air mg/m^3	Water ug/l	Sediment[s] ug/kg	Soil[v] ug/kg
Picoline [2-]	109-6-8	140	-----	-----	9900[w]
Polychlorinated biphenyls	1336-36-3		**1.2 e-4**[a,z]	**59.8**[u]	0.332
Polychlorinated dibenzo-p-dioxins	PCDD-S		2.78 e-7[b]	**0.011**	1.99 e-4
Polychlorinated dibenzofurans	51207-31-9		-----	-----	0.0386
Pronamide	23950-58-5		-----	-----	13.6[x]
Propionitrile	107-12-0	1.87	-----	-----	49.8[w]
Propylamine [N-nitrosodi-n-]	621-64-7			-----	544
Pyrene	129-0-0		0.3[g]	**195**[u]	7.85 e+4
Pyridine	110-86-1	13.7	2380[g]	106	1030[w]
Safrole	94-59-7		-----	-----	404
Selenium (Total)	7782-49-2		5[j]		27.6
Silver (Total)	7440-22-4		**0.12**[f,z]	500[t]	4040
Silvex	93-72-1		**30**[a,z]	**675**[z]	109[x]
Styrene	100-42-5	0.946	**32**[d,z]	**254**[z]	4690
Sulfide	18496-25-8				3.58
Tetrachlorobenzene [1,2,4,5-]	95-94-3		**3**[a,z]	**1252**[z]	2020
Tetrachlorodibenzo-p-dioxin [2,3,7,8-]	1746-1-6		**3 e-9**[a,z]	**1.2 e-4**[z]	1.99 e-4
Tetrachloroethane [1,1,1,2-]	630-20-6	22.5	-----	-----	2.25 e+5
Tetrachloroethane [1,1,2,2-]	79-34-5	353	**380**[a]	**850**	127
Tetrachloroethene	127-18-4	69	**45**[a]	**990**	9920

U.S. EPA, Region 5, RCRA Ecological Screening Levels August 22, 2003

Chemical	CAS No.	Air mg/m^3	Water ug/l	Sediment[s] ug/kg	Soil[v] ug/kg
Tetrachlorophenol [2,3,4,6-]	58-90-2		**1.2**[a,z]	**129**[z]	199
Tetraethyl dithiopyrophosphate	3689-24-5		13.9[b]	560	596
Thallium (Total)	7440-28-0		**10**[a]		56.9
Tin (Total)	7440-31-5		**180**[d]		7620
Toluene	108-88-3	1040	253[f]	**1220**[z]	5450
Toluidine [5-nitro-o-]	99-55-8			-----	8730
Toluidine [o-]	95-53-4			-----	2970[w]
Toxaphene	8001-35-2		**1.4 e-4**[a,z]	**0.077**[z]	119
Trichlorobenzene [1,2,4-]	120-82-1		**30**[a,z]	**5062**[z]	1.11 e+4
Trichloroethane [1,1,1-]	71-55-6	4170	**76**[d,z]	**213**[z]	2.98 e+4
Trichloroethane [1,1,2-]	79-0-5	11.6	**500**[a,z]	**518**[z]	2.86 e+4
Trichloroethylene	79-1-6	1220	**47**[h,z]	**112**[z]	1.24 e+4
Trichlorofluoromethane	75-69-4	5150		-----	1.64 e+4
Trichlorophenol [2,4,5-]	95-95-4			-----	1.41 e+4
Trichlorophenol [2,4,6-]	88-6-2		**4.9**[d]	**208**	9940
Trichloropropane [1,2,3-]	96-18-4	3.32	-----	-----	3360
Trichlorphenoxyacetic acid [2,4,5-]	93-76-5		686[g]	5.87 e+4	596
Triethyl phosphorothioate [O,O,O-]	126-68-1		58.2[b]	189	818
Trinitrobenzene [Sym-]	99-35-4			-----	376[w]
Vanadium (Total)	7440-62-2		**12**[a,z]		1590

U.S. EPA, Region 5, RCRA Ecological Screening Levels August 22, 2003

Chemical	CAS No.	Air mg/m^3	Water ug/l	Sediment[s] ug/kg	Soil[v] ug/kg
Vinyl acetate	108-5-4	359	248[g]	13	1.27 e+4[w]
Vinyl chloride	75-1-4	0.221	**930**[a]	**202**	646
Xylenes (total)	1330-20-7	135	**27**[d, z]	**433**[z]	1 e+4[x]
Zinc (Total)	7440-66-6		**65.7**[j, k, z]	**1.21 e+5**[u]	6620[y]

[a] = Michigan water quality standards, Rule 57 water quality values, July 23, 2003. Available at: http://www.michigan.gov/deq/0,1607,7-135-3313_3686_3728-11383--,00.html. The water ESL data for acenaphthene, BHC (gamma), cyanide and parathion are Michigan (final chronic value or FCV) Tier I criteria. Likewise, water ESL data for dieldrin, dioxin, DDT, endrin, hexachlorobenzene, hexachlorobutadiene, mercury, PCB's and toxaphene represent wildlife values (see Notes at end of these footnotes for dioxin, DDT, mercury and PCB's). All of the remaining data are Tier II values.

[b] = Water Ecological Screening Level (ESL) based on exposure to a mink (*Mustela vison*).

[c] = Indiana water quality standards, Title 327, Article 2, of the Indiana Administrative Code, Feb. 4, 2002. Available at: http://www.ai.org/legislative/iac/t03270/a00020.pdf The water ESL for toxaphene is from the Indiana chronic aquatic criterion for all waters outside of mixing zones (see Table 1 under Rule 1 of 327 IAC 2-1-6 Minimum Surface Water Quality Standards at the above Internet site). The remaining water ESL data are either wildlife values (for dioxin, DDT, mercury and PCB's) or Tier II values for the Indiana Great Lakes Basin (see Great Lakes Basin Criteria and Values Table as developed under Rule 1.5 of 327 IAC Article 2 as referenced above).

[d] = Ohio water quality standards, Chapter 3745-1 of the Ohio Administrative Code, Dec. 30, 2002. Available at: http://www.epa.state.oh.us/dsw/rules/3745-1.html The water ESL data for endrin and parathion are Ohio aquatic life Tier I criteria from the Outside Mixing Zone Average (OMZA). Wildlife values are available for dioxin, DDT, mercury and PCB's. All of the remaining data are Ohio aquatic life Tier II values from the OMZA. See Ohio summary tables for water quality criteria and values along with reference on the development of Tier I criteria and Tier II values.

[e] = Water ESL based on exposure to a belted kingfisher (*Ceryle alcyon*).

[f] = Minnesota water quality standards, Rule 7052.0100, Subpart 2 (water ESL data for arsenic & benzene represents aquatic life chronic standards and dioxin, DDT, mercury and PCB's represents wildlife values), April 13, 2000. Rule 7050.0222, Subpart 2, Feb. 12, 2003. Available at: http://www.revisor.leg.state.mn.us/arule/7050/0100.html and http://www.revisor.leg.state.mn.us/arule/7052/0222.html

[g] = Region 5, RCRA Interim Criteria, based on Aquire database with acceptable review codes and endpoints (life cycle). Must have eight or more acceptable studies (i.e., chronic and/or acute).

[h] = GLWQI Tier II value as presented in: Suter, G.W. II and Tsao, C.L. 1996. Toxicological benchmarks for screening potential contaminants of concern for effects on aquatic biota, 1996 Revision. ES/ER/TM-96/R2. Available at: http://www.esd.ornl.gov/programs/ecorisk/ecorisk.html

[i] = U.S. EPA 2001 Update of Ambient Water Quality Criteria for Cadmium (EPA 822-R-01-001).

[j] = U.S. EPA National Recommended Water Quality Criteria: 2002 (EPA 822-R-02-047)

[k] = For hardness-dependent metals (beryllium, cadmium, chromium^{+3}, copper, lead, nickel and zinc), freshwater chronic criteria are based on soft water with a total hardness of 50 mg/L as $CaCO_3$. Soft water is common within Region 5 and this water ESL may be recalculated when site specific water hardness is less than 50 mg/L.

[l] = U.S. EPA Ambient Water Quality for Chloroalkyl Ethers (EPA 440/5-80-030). No definitive data available concerning chronic toxicity. The water ESL is based on no adverse effects for a chronic toxicity embryo-larval test of the fathead minnow.

[m] = U.S. EPA Ambient Water Quality for Nitrophenols (EPA 440/5-80-063). The acute value of 230 ug/l was adjusted with an uncertainty factor of ten for 2,4-dinitrophenol and 4,6-dinitro-o-cresol since no chronic criteria are available.

[n] = Wisconsin Surface Water Quality Criteria and Secondary Values for Toxic Substances, NR 105.07(1)(b), Sept.1, 1997. Available at: http://www.legis.state.wi.us/rsb/code/nr/nr100.html

[o] = Illinois water quality standards, Title 35, Part 302.208, Dec. 20, 2002. Available at: http://www.ipcb.state.il.us/SLR/IPCBandIEPAEnvironmentalRegulations-Title35.asp

[p] = The criterion for pentachlorophenol is pH dependent and is based on a pH of 6.5.

[q] = U.S. EPA Ambient Water Quality for Phthalate Esters (EPA 440/5-80-067). A chronic value of 3 ug/L that resulted in significant reproductive impairment was adjusted with an uncertainity factor of ten.

[r] = Environment Canada. September 1994. Interim Sediment Quality Assessment Values. Ecosystem Conservation Directorate. Evaluation and Interpretation Branch.

[s] = Unless noted otherwise, all Sediment ESLs were derived using equilibrium partitioning (EqP) equation and the corresponding water ESL. Note: Sediment ESL = K_{oc} x Water ESL x 0.01.

[t] = Ontario Ministry of the Environment. August 1993. Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario.

[u] = Consensus based threshold effect concentrations (TEC) as presented in MacDonald et. al. 2000. Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Arch Environ Contam Toxicol 39:20-31 (see Table 2). The TEC for mercury had a high incidence of toxicity and was not used. These values do not consider bioaccumulation nor biomagnification.

[v] = Unless noted otherwise, all Soil ESLs are based on exposure to a masked shrew (*Sorex cinerus*).

[w] = Soil ESL is based on exposure to a meadow vole (*Microtus pennsylvanicus*).

[x] = Soil ESL is based on exposure to a plant.

[y] = Soil ESL is based on exposure to soil invertebrates (e.g., earthworms).

[z] = New ESL data is lower than the previous table.

Notes: New ESL data are displayed in bold font and a dashed line (e.g., -----) is used to show when data was deleted from the previous table (i.e., supporting data was inadequate). All six states in EPA Region 5 have the same water ESL's for dioxin, DDT, mercury and PCB's which are based on a wildlife value. A summary report will be created on the development of soil benchmarks including equations, criteria and references. Likewise, a report will be prepared on the development of water benchmarks that are based on mink and belted kingfisher exposure.